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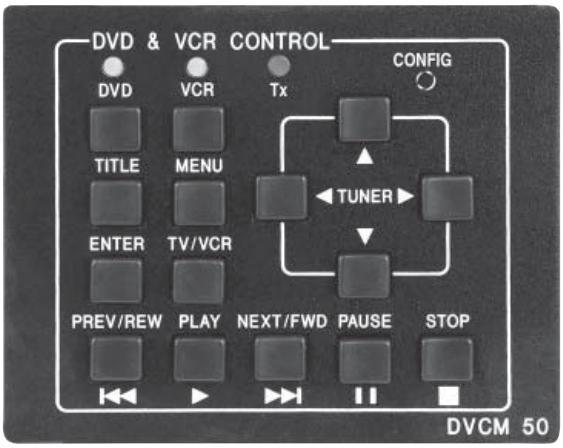
Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual



DVCM 50

DVD/VCR Control Module

68-1098-01 **Rev. A**
11 05

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Fax 07131 911203

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

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Chapter One

Introduction

About This Manual

About the DVCM 50 DVD/VCR Control Module

Features

Application Diagrams

Introduction

About this Manual

This manual contains installation, configuration, and operating information for the Extron DVCM 50 DVD/VCR Control Module.

NOTE *The terms "DVCM," "DVCM 50," and "control module" are used interchangeably in this manual to refer to the DVCM 50 DVD/VCR Control Module.*

About the DVCM 50 DVD/VCR Control Module

The DVCM 50 DVD/VCR Control Module is a four-space Architectural Adapter Plate (AAP) module that is used for controlling DVDs and VCRs. It can be used with an MLC 52 or MLC 104 MediaLink Controller, or as a standalone control module, sending IR signals directly to the DVD or VCR. The DVCM 50 can be configured by the following methods:

- IR Learning from a DVD or VCR remote control
- IR data transfer (beaming) from another DVCM that has been configured
- Using IR drivers that have been downloaded using the Extron's Windows®-based configuration software program

Features

Standalone operation available — If desired, the DVCM 50 can be used as a standalone unit without connection to, or dependence on, a system switcher or MediaLink controller.

Macro and toggle button modes **—** Each button can be set to send out multiple IR commands. A button configured for macro mode can issue up to four commands in sequence from a single button press. A button configured for toggle mode can issue up to four different commands, sending out a different command each time the button is pressed.

Front panel configuration port — This serial port enables advanced configuration, driver downloads, and firmware updates to be performed from the front panel without the need to remove the control module from its mounting. The optional Extron configuration cable (part #70-335-01) connects the DVCM 50 to the PC's RS-232 port.

Three configuration methods — The DVCM 50 can be configured easily using the following methods:

- **IR Learning —** Allows the DVCM 50 to be set up directly from the DVD or VCR remote control without the need for software.
- **IR data transfer ("beaming") —** Duplicates complete configuration information from one DVCM 50 to another without cables or software.
- **Windows-based configuration software —** Combined with one of the many IR drivers available on the Extron Web site, Extron's MLC 52/DVCM 50 Control Program software provides fast and simple setup.

Front panel security lockout — Front panel lockout (executive mode) can be implemented if the DVCM 50 is installed in an unsecured environment where easy access is not desirable.

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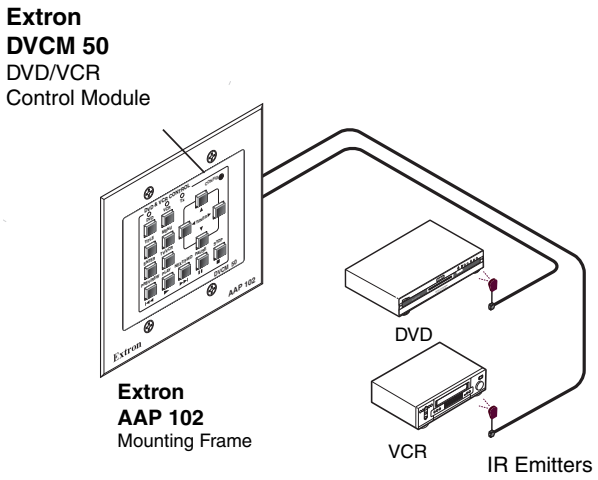
Flexible mounting options — With one of the many available mounting plates, the DVCM 50 can be mounted in a variety of locations, including walls, lecterns, and tables.

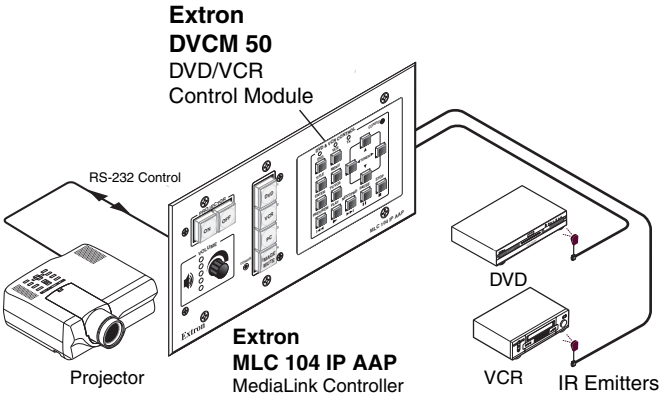
Remote control — The optional IR 452 Remote Control with the IR Link or IRL 20 signal repeater provides infrared (IR) remote control of the DVCM unit from up to 30′ away.

Application Diagrams

The following figures show examples of how the DVCM 50 may be connected.



DVCM 50 configured as a standalone control module



DVCM 50 with an MLC 104 MediaLink Controller

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Introduction, cont'd

Chapter Two

Installation

Installation Overview

UL Requirements

Mounting the DVCM 50

Rear Panel Features

Wiring the Control Connector

Installation

Installation Overview

Installation and service must be performed by authorized personnel only. To install and set up the DVCM 50, follow these steps:

1. Prepare the installation site as appropriate. Prepare the cables and, if necessary, cut a hole in the wall and install an electrical box or mounting bracket (mud ring). Follow the instructions provided with the optional mounting bracket or wall box.
2. Attach the DVCM 50 to a device faceplate (e.g., the MLC 104 AAP) or a wall plate (e.g., the AAP 102) that has a four-space AAP opening.
3. Attach cables and the dual IR Emitter to the control connector on the rear panel of the DVCM. Connect the cables to the DVD and/or VCR, and to the optional IR Link or IRL 20, as appropriate.
4. Connect power cords and turn on all devices, including the DVCM.
5. Configure the DVCM 50 by using one of the following methods:
   - IR Learning (See *Configuring using IR Learning*, in chapter 3.)
   - IR Data Transfer (beaming) (See *Configuring using data transfer*, in chapter 3.)
   - Windows®-based configuration software program (See *Using the Windows®-based configuration software* in chapter 5 for detailed information on the configuration software.)
6. Test the system: press the DVCM's buttons, and observe the DVD player and/or VCR responses. If they are not responding properly, ensure that all devices are plugged in and receiving power. Check the cabling and make adjustments as needed.
7. (Optional) Mount the DVCM to the wall or furniture, as follows:
   a. If using the optional external power supply, disconnect it at the power source end (not at the DVCM).
   b. Disconnect the other devices' power.
   c. Secure the faceplate containing the DVCM onto the wall, furniture, mounting bracket, or UL-approved electrical wall box. See *Mounting the DVCM 50*, later in this chapter.
   d. Restore power to the DVCM and to the connected devices.

NOTE *The DVCM optional external power supply is not needed if the DVCM is used with the MLC 104.*

UL Requirements

The Underwriters Laboratories (UL) requirements listed below pertain to the installation of the DVCM 50 into a wall or furniture.

1. This unit is not to be connected to a centralized DC power source or used beyond its rated voltage range.

2. This unit must be installed in a UL listed junction box.

NOTE *The UL approved electrical wall box (junction box) is not included with the DVCM; the installer is responsible for obtaining and installing the box.*

3. This unit must be installed in accordance with the National Electrical Code.

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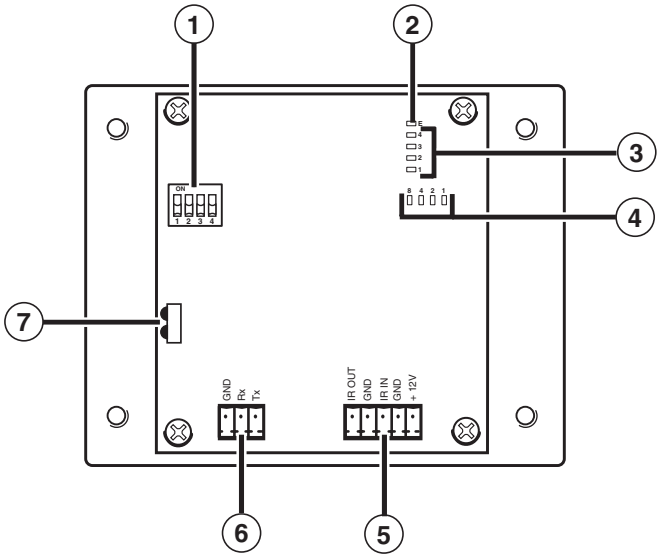
Mounting the DVCM 50

The DVCM 50 must be attached to a device faceplate, such as the MLC 104 AAP, or to an AAP wallplate, such as the AAP 102, and cabled before the device or wallplate is installed in a wall or furniture. The DVCM can be mounted in any Extron wallplate or faceplate that can hold four single-space AAPs, arranged in two rows of two AAPs each. The screws needed for installing the DVCM 50 are built into its front panel, so no additional screws are needed.

1. Before any cables are attached, insert the control module's screws through the holes in the device faceplate or the AAP wallplate. Secure the control module to the faceplate or wallplate with the provided hardware.
2. After you have connected all cables and programmed the DVCM's buttons, mount the device faceplate or AAP wallplate with the DVCM attached onto a wall, electrical wall box, mounting bracket, or furniture, following the instructions provided with the mounting option.

Rear Panel Features



DVCM 50 rear panel

1. **Configuration switches** — These DIP switches place the DVCM in IR learning mode or data transfer mode.
   - **Switch 1:** Enables IR learning.
   - **Switch 2:** Enables data transfer, such as cloning the DVCM's configuration onto another DVCM 50.
   - **Switch 3:** When this switch is placed in On position, commands are issued only once when a button is pressed and held. If the switch is set to Off, its commands are issued repeatedly for as long as the button is held.
   - **Switch 4**: Enables MLC 104 input mapping.
2. **Enable Macro LED** — The LED located immediately above the four green IR LEDs is labeled E, for Enable Macro. This LED lights orange when you place a button in macro mode. (See *Setting up button macros*, in chapter 3.)

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Installation, cont'd

③ **IR Learning indicator LEDs** — Each button on the DVCM 50 front panel has four memory blocks, which can be programmed with up to four IR commands. The IR Learning indicator LEDs provide visual feedback, indicating the following:

- Which of the four memory blocks contains a command
- Which of the four memory blocks is ready to be programmed or configured.
- The IR Learning status of the control module

④ **Button Indicator LEDs** — These LEDs light in various patterns to indicate which button on the front panel has been pressed when the DVCM is in learning mode (configuration switch #1 is in On position).

⑤ **Control and power connector** — This five-pole, 3.5 mm captive screw connector is used for IR control of the DVD and VCR, and for DC power. (See *Wiring the Control Connector*, later in this chapter, for information on how to connect supported devices to this connector.)

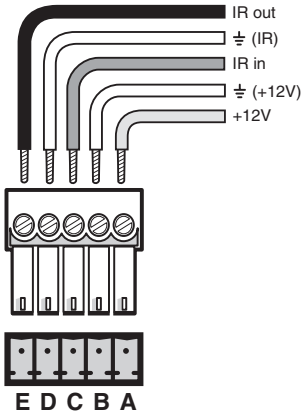
⑥ **MLC 104 communication port** — This 3.5 mm, 3-pole captive screw connector, located near the lower-left corner of the rear panel, is used for connecting to the MLC 104 (see chapter 4, *Special Application*, for more information on the MLC 104). When the DVCM is operating in standalone mode, this port is not used.

⑦ **IR Learner/Transmitter LEDs** — The two LEDs (one for transmitting, one for receiving) send and receive IR signals, enabling the DVCM to learn commands and clone configurations from another DVCM. (See chapter 3 for more details.)

Wiring the Control Connector

Before mounting the DVCM 50 on the wall or furniture, you need to connect all cable wires to the appropriate connector pins on the DVCM rear panel. Use cable clamps to hold cables in place for strain relief. Trim back or insulate exposed cable shields with heat shrink to prevent short circuits.

The control connector contains ports to which you can connect cables for IR-controlled devices and AC power. The illustration below shows the DVCM control connector's pin assignments that are covered in detail on the following pages.



Pinout guide for the DVCM 50 control connector

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The ports in the control connector, from left to right, have the following functions:

IR Out — Used for connecting an IR emitter to issue IR commands for DVD and VCR control. Up to two emitters can be wired to this port. There is a maximum of 100′ wiring distance from the port to the emitter.

GND — Ground for IR In and IR Out

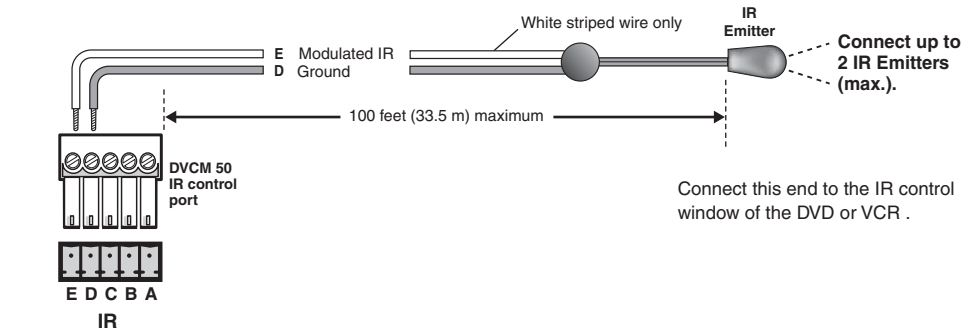
IR In — Used for connecting an optional IR Link or IRL 20, so that the IR 452 remote can control the DVCM.

GND — Ground for the +12 VDC power

+12V — Power input for the DVCM (12 VDC)

Wiring for IR control

To control the DVD or VCR via IR, connect Extron IR Emitters to the IR Out port of the DVCM control connector. Up to two IR emitters can be connected via this connector at one time. Wire the connector as shown in the illustration below.


White striped wire only
IR Emitter
E Modulated IR
D Ground
Connect up to 2 IR Emitters (max.).
100 feet (33.5 m) maximum
DVCM 50 IR control port
Connect this end to the IR control window of the DVD or VCR .
E D C B A
IR
For the IR Emitter only

Wiring for IR control

Wiring for IR remote control

An optional IR Link or IRL 20 can be connected to the IR In port to enable the DVCM to receive IR signals from the IR 452 hand-held remote control, after the DVCM has been mounted (and its IR Learner/Transmitter LEDs are not accessible).

NOTE *Only one IR Link or one IRL 20 can be attached to the DVCM 50.*

To wire the IR Link for use with your DVCM, follow these steps:

1. Prepare the site where the IR Link will be installed and install a wall box, following the directions in the *IR Link User's Manual*, provided with your IR Link equipment.
2. Cut the required length of Extron Comm-Link cable to go between the DVCM 50 and the IR Link. This cable length should not exceed 150 feet (45 m).

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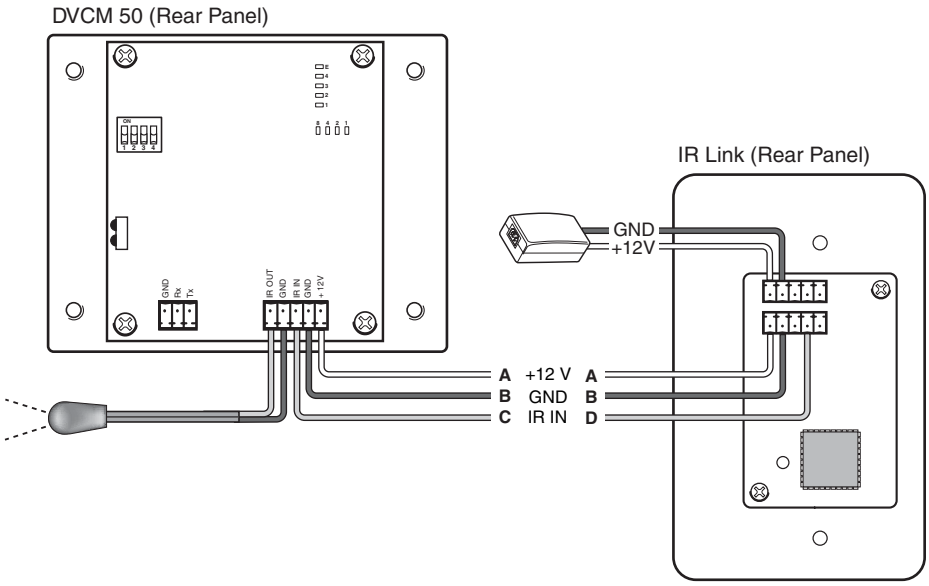
Installation, cont'd

3. Attach a 3.5 mm, 5-pole captive screw connector to each end of the cable. Only three wires are required:
   - A (DVCM) to A (IR Link)
   - B (DVCM) to B (IR Link)
   - C (DVCM) to D (IR Link)
4. Connect the wires as shown in the illustration below. Connectors are included with the IR Link, but the cable must be purchased separately.
5. Plug one 5-pole connector into one of the IR Link's communications connectors.
6. Plug the other 5-pole connector into the rear panel control port of the DVCM 50.



Wiring the IR Link for IR 452 remote control

NOTE *Connect a maximum of one IR Link or IRL 20 to the DVCM 50.*

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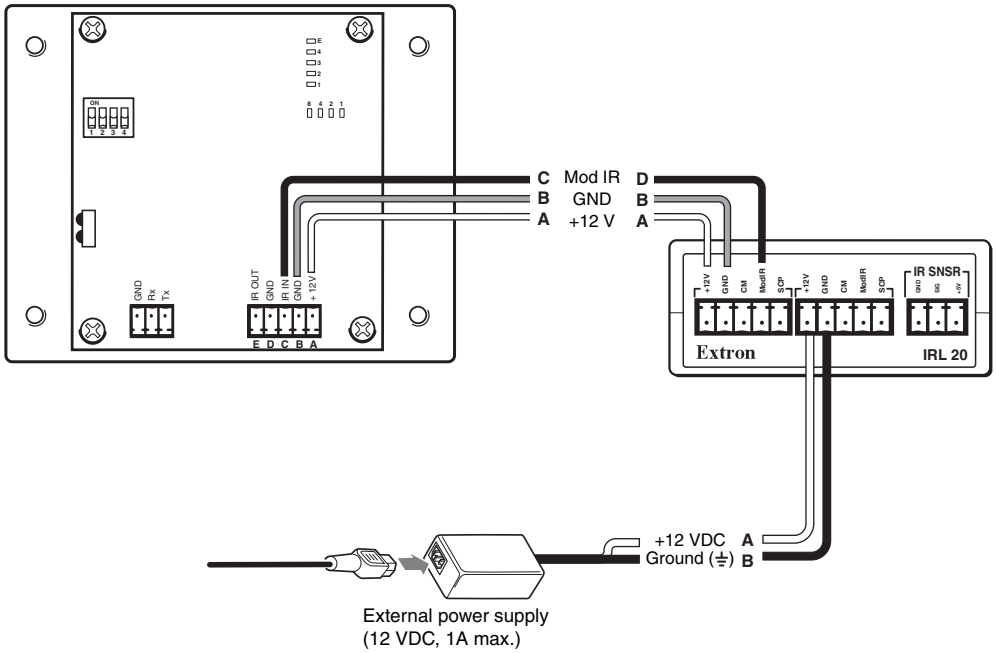
Wiring the IRL 20

The Extron IRL 20 is a hard-wired IR signal receiver, which can be used with the DVCM 50 and the IR 452 remote control. The IRL 20 receives a signal via its front panel from the IR 452, which instructs the DVCM 50 to issue an IR command.

Wire and connect the IRL 20 to the DVCM 50 as described below.



Connecting the DVCM 50 and the IRL 20

1. If it was not already done, cut the required length of Extron Comm-Link cable to go between the DVCM and the IRL 20. See appendix A for cable part numbers. The maximum total distance between an Extron control module and the IRL 20 is 150′ (45 m).
2. Attach a 3.5 mm, 5-pole captive screw connector to the end of the cable that will be plugged into the IRL 20.
3. Connect the wires on the other end of the cable to the provided 3.5 mm 5-pole captive screw connector as described below, and plug this connector into the DVCM.
   - A (DVCM) to A (IRL 20)
   - B (DVCM) to B (IRL 20)
   - C (DVCM) to D (IRL 20)

NOTE *Do not connect more than one IRL 20 or IR Link (either in parallel or in series) to the DVCM 50.*

4. Plug the 5-pole connector end of the cable that you wired in step **2** into one of the IRL 20's communications connectors.
5. Connect power to the DVCM 50 or to the IRL 20.

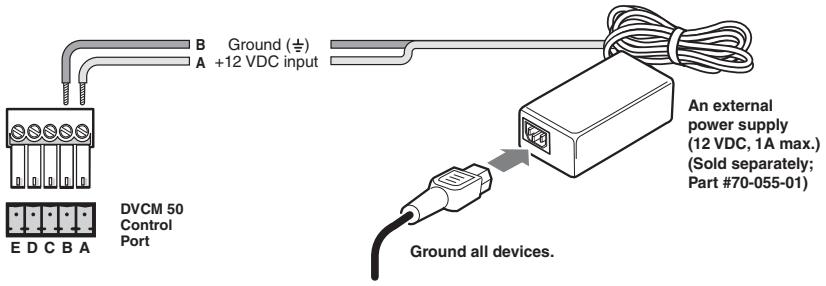
NOTE *+12 VDC power is shared between the DVCM 50 and the IRL 20 when they are connected. You can wire the power supply to either the DVCM or the IRL 20.*

Installation, cont'd

Wiring the power connector

The control connector also contains a power connector for the DVCM 50. You can connect the optional external 12 VDC power supply to this port to power the DVCM as shown in the following diagram.

NOTE *The power supply is not included with the control module. The DVCM 50 can share power with an MLC 104 or MLC 52.*



Connecting the DVCM 50 to the external power supply

NOTE *Check the power supply's polarity before connecting it to the DVCM.*

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3

Chapter Three

Configuration and Operation

DVD and VCR Control

Front Panel Components

Programming the DVCM 50 Using IR

Operating the DVCM 50 Using IR Remote Control

Resetting the DVCM 50

Locking the Front Panel (Executive Mode)

Configuration and Operation

DVD and VCR Control

The DVCM 50 can control a DVD player or a VCR by using IR. The DVCM must be configured for DVD/VCR control in one of the following ways before it will send commands to the DVD player or the VCR:

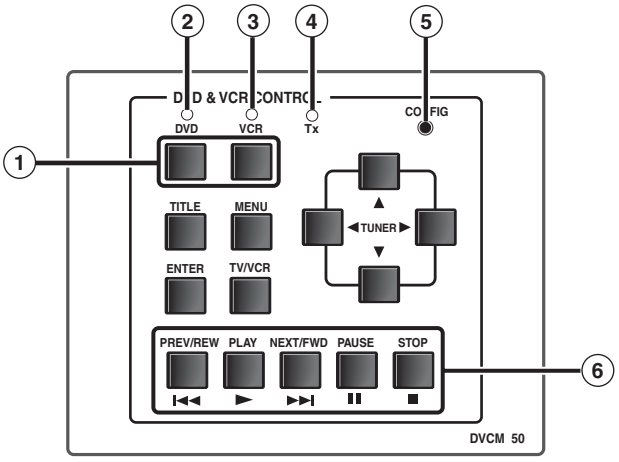
- The Windows-based configuration software can be used to configure the DVCM 50 by enabling you to do either of the following:
  - Load Extron IR drivers appropriate for your DVD/VCR. An IR driver file can be loaded from the DVCM 50 software CD or downloaded from the Extron Web site (www.extron.com).
  - Restore a DVCM configuration that was set up previously, then saved to a file.

  See chapter 5 and the Windows®-based configuration software Help for details on setting up the DVCM and for downloading, programming, or learning DVD/VCR control commands using the software.
- IR commands can be entered directly from an IR remote control into the DVCM through IR learning. IR learning is convenient for installing new or updated commands into the DVCM in the field. It can be performed with or without the use of software.
- A DVCM 50 can transfer/configure (duplicate or clone its configuration) to another DVCM 50 via IR data transfer without the use of cables or software.

NOTE *Configurations are stored in non-volatile memory. Therefore, if the power to the unit is interrupted, the DVCM retains its settings and configuration.*

Front Panel Components

The DVCM 50 front panel contains 15 buttons for controlling the DVD and VCR. Each of these buttons can be programmed with up to four IR commands/functions. The front panel also contains a configuration port, through which the DVCM can be connected to a PC's RS-232 port to program the DVCM's buttons, update firmware, and save and restore the DVCM's configuration to the PC. Finally, three LEDs on the front panel indicate the DVCM's operating mode (DVD or VCR) and whether IR signals are being transmitted.



DVCM 50 front panel

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1. **DVD and VCR (mode selection) buttons** — Use these buttons to switch the DVCM 50 operating mode between DVD and VCR. After one of these buttons is pressed, the DVCM buttons issue commands that control only the device with which the button is labeled (DVD or VCR).

   For example, if you press the DVD button, the DVCM switches to DVD mode. Subsequently, each DVCM button that you press issues one of its programmed DVD commands (to which only the DVD player responds). If the DVD player is a combination DVD/VCR, the DVCM sends only commands that activate the device's DVD functions. If the DVCM is already in DVD mode, pressing its DVD button does not cause it to switch modes.

NOTE *The DVD and VCR buttons each have four memory blocks that can be programmed with commands. In addition, pressing either mode selection button always causes the DVCM to switch to the mode of the button that was pressed.*

2. **DVD indicator LED** — This LED glows amber when the DVCM is in DVD mode.

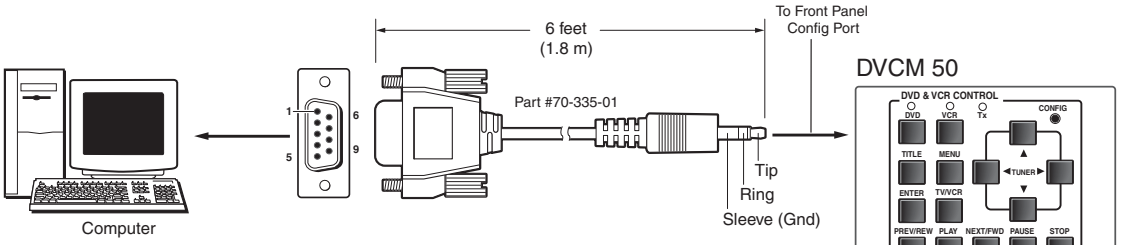
3. **VCR indicator LED** — This LED glows amber when the DVCM is in VCR mode.

4. **Tx (Transmission) LED** — This green LED blinks while the DVCM is transmitting IR commands. It also blinks when any programmed front panel button is pressed. If a button is held down, the Tx LED continues to blink until the button is released.

NOTE *If a button that was not programmed is pressed, the Tx LED does not blink.*

5. **Configuration port** — This port is used for system configuration and for loading control files into the DVCM. Commands can be received through this port from the PC, using Simple Instruction Set (SIS™) or the Windows-based configuration software. The protocol for this configuration port is as follows:

   - 9600 kb/sec
   - 8 data bits
   - 1 stop bit
   - No parity



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

2.5 mm connector cable for the configuration port

See chapter 5 for details about using the software to configure the system.

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⑥ **DVD and VCR control buttons** — These buttons may be used to control both a DVD and a VCR. The buttons can be programmed via IR Learning, data transfer, or the Windows-based configuration software to perform the functions for which they are labeled. Each of these buttons has eight memory blocks (four available in DVD mode and four for VCR mode), which can be programmed with commands.

Other buttons on the front panel

The remaining front panel buttons are typically programmed to initiate the functions with which they are labeled. Except for **Tuner ▲** and **▼**, the buttons listed below are available in **either** DVD mode **or** VCR mode; they do not function in both modes. Each of these buttons has four memory blocks that can be programmed with commands.

NOTE *The buttons on the DVCM 50 front panel are labeled with the names of functions that are typically found on a DVD player or a VCR and their remote controls. However, if desired, you can program these buttons with different functions.*

TV/VCR — (VCR mode only) Program this button with the IR command that causes the VCR to switch between operating as a TV tuner and operating as a VCR. This button can be programmed and can issue IR commands **only in VCR mode**.

Title — (DVD mode only) Program this button with the IR command that displays the main menu on the display device screen. This button can be programmed and can issue IR commands **only in DVD mode**.

Enter — (DVD mode only) Program this button with the IR command that selects items from the DVD's on-screen menu. This button can be programmed and can issue IR commands **only in DVD mode**.

Menu — (DVD mode only) Program this button with the IR command that displays the DVD menu on your display device. This button can be programmed and can issue IR commands **only in DVD mode**.

Tuner ◀ and ▶ — (DVD mode only) Program these buttons with the IR command that moves the cursor right or left on the screen in order to select menu items or function icons. These buttons can be programmed and can issue IR commands **only in DVD mode**.

Tuner ▲ and ▼ —

VCR mode: Switches TV channels up and down when the VCR is in tuner mode.

DVD mode: When programmed, moves the cursor up and down between menu items or other items on the screen.

Programming the DVCM 50 Using IR

The DVCM 50 can be programmed/configured via IR by the following methods:

- IR learning from your DVD or VCR remote control
- IR data transfer from another DVCM 50 that has been configured previously

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Configuring using IR Learning

You can configure the DVCM 50 by using IR Learning, which does not require configuration software. By this method, you can program the functions on your DVD or VCR remote control into the buttons on the DVCM front panel.

To program the DVCM via IR Learning, follow these steps:

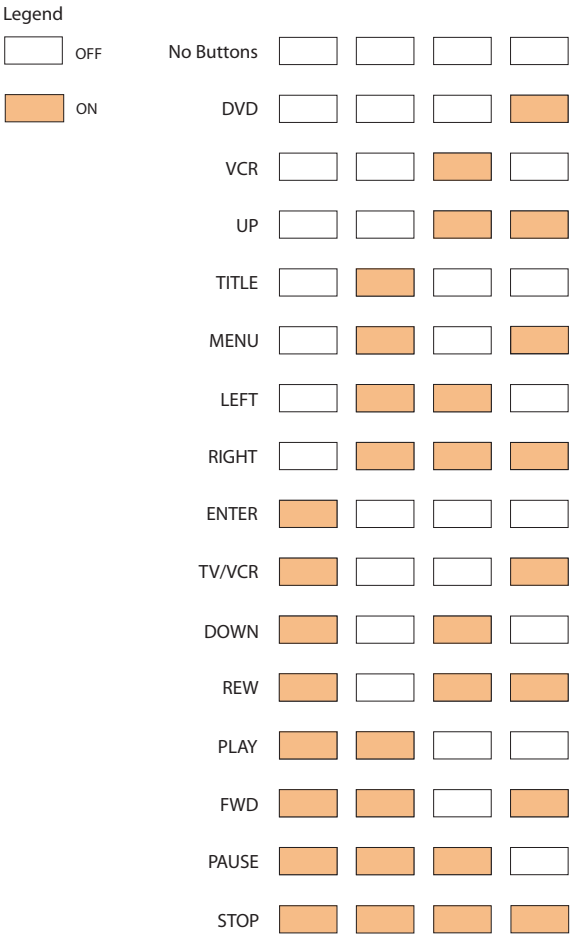
1. Apply power to the DVCM.
2. On the rear panel, set configuration switch #1 to On. All other switches should be Off.
3. Press the DVD or VCR button to select the mode in which the button will be programmed.

NOTE *When you press the DVD or VCR mode button, the LED lights above the button that you pressed, indicating that the front panel buttons will be programmed for that mode.*

4. Press the button on the front panel that will store the IR code that you want the DVCM to learn.

The following takes place on the DVCM rear panel:

- The orange button indicator LED(s) light and remain lit to show which button was pressed. The following diagram shows which LEDs are lit when each button is pressed.



Button press indicator LEDs

Configuration and Operation, cont'd

NOTE *The following buttons **cannot** be programmed in VCR mode. The DVCM must be in DVD mode to program them.*

Title

Menu

Enter

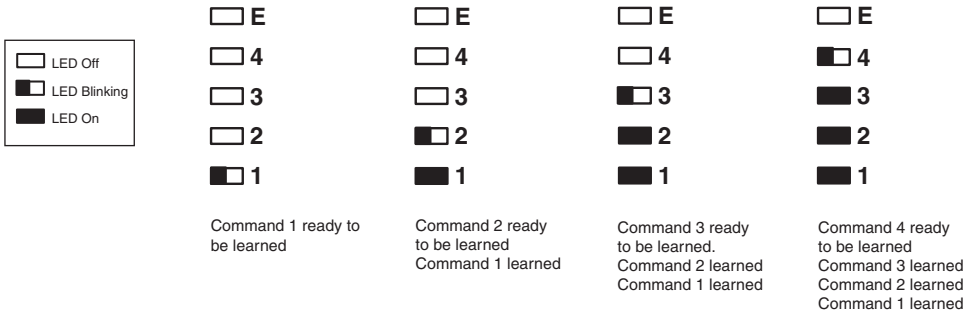
Right ▶ (Tuner)

Left ◀ (Tuner)

NOTE *The* TV/VCR *button **cannot** be programmed in DVD mode. It can be programmed only in VCR mode.*

If you press a button that does not function in the current mode, the button's orange indicator LED(s) blink three times, indicating that the button cannot be programmed.

- The IR Learning LED that indicates the button memory block currently available for programming begins to blink. (See *IR Learning indicators* in the *Rear Panel Features* section of chapter 2 for further information.) The LEDs located below the blinking LED light steadily, indicating that they already contain commands.



Activation of learning indicator LEDs during button programming

5. Within 5 seconds, point the DVD or VCR remote control at the IR learning sensors on the rear panel, and press the remote control button whose function you want the selected DVCM button to learn.

If the IR command is learned successfully, the IR Learning indicator LEDs blink in rapid progression from the top to the bottom, then back to the top. (If the IR code that you entered results in an error, the buttons flash randomly.)

NOTE *For repeating command codes, such as those that increment/decrement a function (for example, scanning up and down through the channels on a VCR in TV mode), hold the button on the DVD or VCR remote control for at least 3 seconds.*

6. If you want to add another command to the same button (you can program up to four commands on one button in each operating mode), press the same DVCM button again. The next Learning LED on the rear panel begins flashing. For example, if you have already programmed two commands on this button, the third LED from the bottom flashes. Repeat step **5** to add the desired command.

If you want to program commands onto another DVCM button, repeat steps **4** and **5** for the next button that you want to program.

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7. When you are finished programming buttons, set configuration switch #1 on the rear panel to Off. Verify that the commands you entered have been learned by pressing the buttons that you programmed and observing the actions of the DVD/VCR.

NOTE *It may be helpful to program all DVD functions first, then program all the VCR functions.*

Programming the DVD and VCR mode buttons

The procedure for programming commands onto the DVD and VCR buttons is the same as the procedure for programming the other buttons (see the previous section), except that you skip step **4**. Pressing either of these buttons **once** accomplishes the following:

- Places the DVCM in button's mode (DVD or VCR, depending on which button was pressed).
- Selects the button's next available memory block for programming.

Setting up button macros

DVCM 50 buttons function in either toggle mode or macro mode. By default, the buttons are in toggle mode, which means that each press of the button initiates one of the commands saved to the button (each button can store up to four commands).

In macro mode, a single press of a button issues all the commands (up to four) that have been programmed on that button, in the order they were programmed, at 1.5-second intervals. An example of a button macro application would be turning on multiple DVDs or VCRs by pressing one button, one time.

To put a button in macro mode, follow these steps:

1. Ensure that power is applied to the DVCM 50.
2. Set configuration switch #1 on the rear panel to On (up).
3. Program the buttons with the desired commands. See *Configuring using IR data transfer* or *Configuring using IR Learning*, earlier in this chapter, for programming procedures.
4. To put the button in macro mode, press and hold it for 3 seconds. The orange LED above the learning indicator LEDs, labeled "E" on the back panel, flashes rapidly five times, then turns off, indicating that the button is now configured for macro mode. Release the button.

   The next time that the button is pressed while configuration switch #1 is set to On (up), the orange E LED lights, indicating that the button is in macro mode.
5. Set configuration switch #1 to Off (down). Verify that the commands have been properly learned by pressing the button you programmed. The commands should be issued in succession at 1.5-second intervals.

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Configuration and Operation, cont'd

Taking a button out of macro mode

To take a button out of macro mode, follow these steps:

1. Place configuration switch #1 on the rear panel in the On (up) position.
2. Press and hold the button that is in macro mode for 3 seconds. The orange E LED blinks three times, then turns off.
3. Press the button again to confirm that the orange E LED has turned off, indicating the button is no longer in macro mode.
4. Set Configuration switch #1 to Off.

NOTE *Commands that have been programmed on the button are **not** erased when the button is taken out of macro mode.*

Removing commands from a button

If you want to delete a command that has been programmed onto a button, you must remove all the commands programmed to that button. Follow these steps:

1. While the DVCM 50 is powered on, set configuration switch #1 to On.
2. Press the DVD or VCR button to place the DVCM in the mode in which you want the commands to be erased.
3. Press the button for which you want to delete commands, then within 2 seconds press the button again. The Learning LEDs turn off.

   Example: If you want to erase the DVD player's Play function from its Play button, first press the DVD button to ensure that the DVCM is in DVD mode. Then, erase the Play function (and all other functions) from the Play button by pressing it twice within 2 seconds.
4. Verify that the button's commands were erased by pressing the button again. If the commands have been erased, only LED #1 (the bottom LED) blinks; and the other LEDs are off.
5. Repeat steps **1** through **3** for any additional buttons that you want to erase. When finished, place switch #1 in the Off position (down).

NOTE *To erase the commands from the DVD or the VCR button, press the button twice: the first time to switch to the desired mode; the second time to erase the commands.*

Configuring using IR data transfer

You can also configure your DVCM 50 by transferring button configuration data to it from another configured DVCM 50 via the two IR LEDs on the back panels of the DVCMs. With this method, you replicate (clone) the other DVCM's configuration on your own unit without the use of software or cables.

To transmit configuration data via IR, both the transferring and the receiving DVCMs must be free of the wall, electrical box, or furniture. The DVCM that is already configured must be powered by an external power supply, or by a power supply shared with the unit that will be configured.

1. Ensure that all configuration switches are set to Off (down) on both the transmitting and the receiving units.
2. Apply power to both units.
3. Align the two units so that the IR Transmit and Receive LEDs of both DVCMs are facing each other, and between 1 and 2 inches apart.

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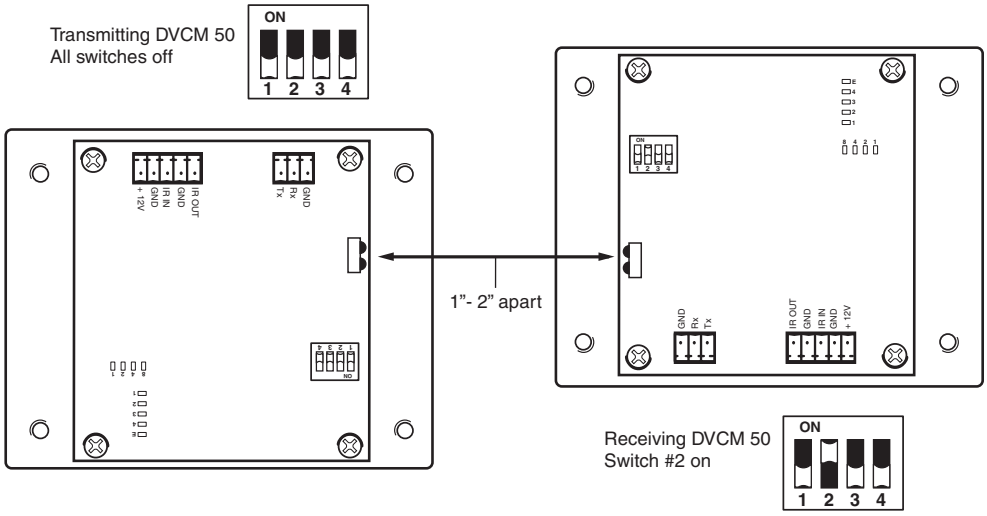
4. On the DVCM that will receive the data, set configuration switch #2 to On (up), and all others to Off (down). (See the illustration below.)

Leave all switches on the **transmitting** unit (the donor unit) set to **Off** (down).



Setting up transmitting and receiving units for wireless data transfer

The data transfer begins when the receiving unit detects the transmitting unit, and the process takes 15 to 20 seconds to complete. (It may take longer if the transmitting unit has multiple commands programmed on each button.)

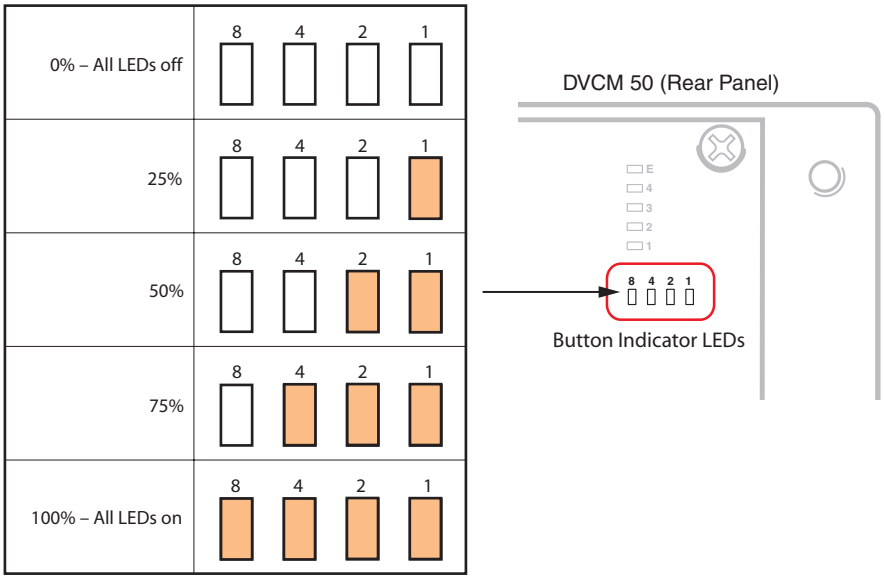
The button indicator LEDs on the rear panel act as data transfer progress indicators. While data is being transferred, these LEDs on both the transmitting and the receiving DVCMs light to indicate the amount of data that has been transferred.

After approximately 25% of the data has been transferred, the first LED on the right lights and remains lit. After another 50% has been transferred, the second LED from the right lights. After 75% of the data is transferred, the third LED from the right lights, and when the transfer is complete, all four LEDS are lit.

The table on the next page shows how each 25% percent increment of transferred data is shown by the button indicator LEDs.

NOTE *IR Link should not be connected to either the receiving unit or the transmitting unit while IR data transfer is being performed.*

Configuration and Operation, cont'd



Button indicator LEDs indicating percentage of data transferred

When the transfer is complete, all the button indicator LEDs remain lit. Proceed to step **5**.

If the transmission is interrupted (for example, the two units become separated so that the IR LEDs are no longer in direct line of sight of each other), and the conditions necessary for transfer are then restored, the two units restart the transfer process.

5. When data transfer is complete, do either of the following:

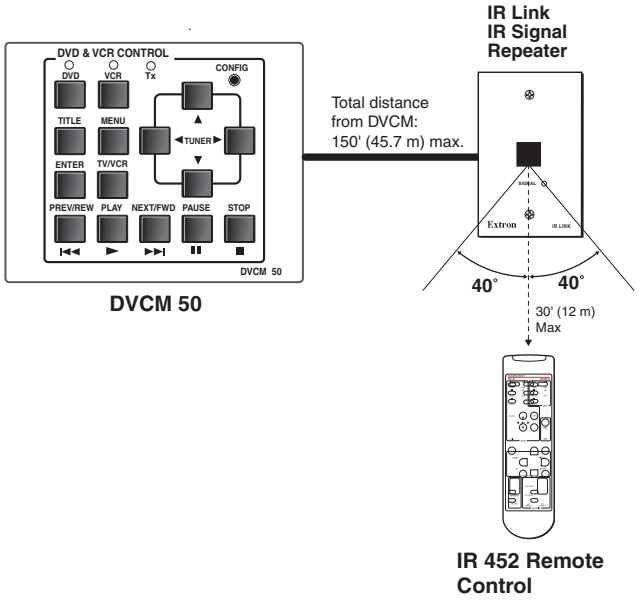
   - If finished configuring, return configuration switch #2 on the receiving DVCM to the Off (down) position. Press any button on both units to return them to the state they were in before the transfer. Reinitialize the receiving unit by pressing any of its front panel buttons.
   - If you want to repeat the transfer process to configure another DVCM 50, repeat steps **3** and **4** for the unit that is to be configured. Press any button on the transmitting unit. The transfer process restarts.

Operating the DVCM 50 Using IR Remote Control

The optional hand-held IR 452 Remote Control can be used in conjunction with an optional IR Link or IRL 20 and the DVCM 50 to operate your VCR and/or DVD player. Each button on the IR 452 remote control, when pressed, sends an IR signal via the IR Link or IRL 20 that emulates the DVCM button with the same name. The DVCM then sends the command to the DVD/VCR.

1. Wire the IR Link to the DVCM 50 and mount it. (See *Wiring for IR remote control*, in chapter 2, for IR Link and IRL 20 wiring instructions. See the *IR Link User's Guide* or the *IRL 20 User's Manual* for mounting instructions.)
2. Using IR Learning, IR data transfer, or the Windows-based configuration software, program the buttons on the DVCM 50 with the commands that you want the IR 452 to be able to issue to the DVD/VCR. (See *Programming the DVCM 50 Using IR*, earlier in this chapter, or *Using the Windows®-based Configuration Software* in chapter 5, for button programming instructions.)

3. To operate a DVD/VCR using the IR 452, point the remote control directly at the IR Link or IRL 20 signal pickup window. The IR 452 has a range of approximately 30′ (12 m) within 40 degrees on either side of the axis.



Using the IR 452 with the DVCM 50

4. Press the IR 452 button for the function you want to initiate. The following takes place:
   - The remote control sends an infrared (IR) signal to the IR Link or IRL 20.
   - The IR Link or IRL 20 relays the IR signal to the DVCM through the DVCM's IR In port, to which the IR Link or IRL 20 is connected.
   - The DVCM recognizes the signal it receives via the IR In port, and responds as if its own equivalent button were pressed, issuing the command to the DVD/VCR.

NOTE *Setup operations on the DVCM 50 cannot be performed from the IR 452.*

Buttons on the IR 452 remote control

The buttons on the optional IR 452 Remote Control duplicate the DVCM 50's front panel controls for normal operation. The DVCM responds to IR signals from the IR 452 as if the corresponding button were pressed on the DVCM.

The IR 452's Display Power button and the VCR and DVD control buttons do not function until commands have been stored in the DVCM's memory. The IR 452's VCR buttons control the first (lowest address numbered) VCR connected to the DVCM. The DVD buttons control the first (lowest address numbered) DVD connected to the DVCM.

Commands are transmitted from the DVCM's IR Out port via the IR Emitters to the DVD/VCR when the corresponding button is pressed on the IR 452 or on the DVCM's front panel.

NOTE *The following IR 452 buttons do not have equivalents and cannot activate memory blocks on the DVCM 50:* ***Power On***, ***Power Off***, ***Mute On***, ***Mute Off***, ***Vol ▲***, ***Vol ▼***, ***PC***, *and* ***Video****. These commands are used with the MLC 52 only.*

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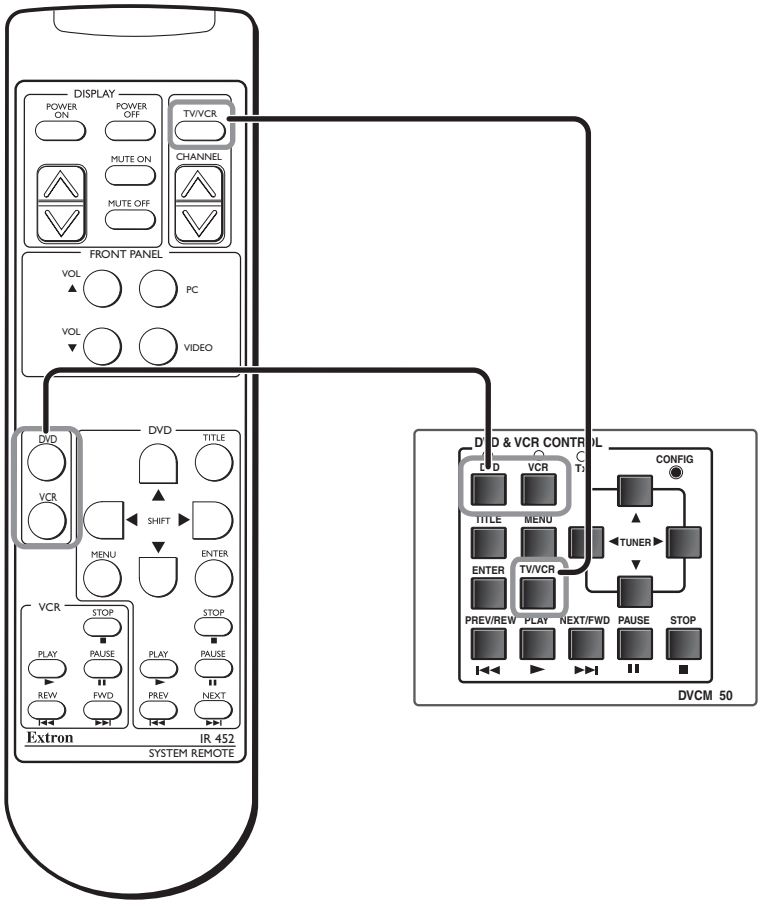
Configuration and Operation, cont'd

The figure below shows the button equivalents of the DVD, VCR, and TV/VCR buttons on the IR 452 and the DVCM 50.



DVD, VCR, and TV/VCR button equivalents on the DVCM 50 and the IR 452

Refer to the *IR 452 User's Manual* for more information on using the IR 452.

Resetting the DVCM 50

If the need ever arises to reset the DVCM 50, you can use one of the following methods:

Factory firmware reset — Press and hold the Stop button while applying power to the DVCM. This method resets the DVCM firmware to the version with which the unit was delivered from the factory. Any codes that you previously programmed on the buttons remain in effect.

Factory configuration reset — Press and hold the DVD and VCR buttons simultaneously while applying power to the DVCM. This method removes all codes from the buttons as well as resetting the unit to the factory default.

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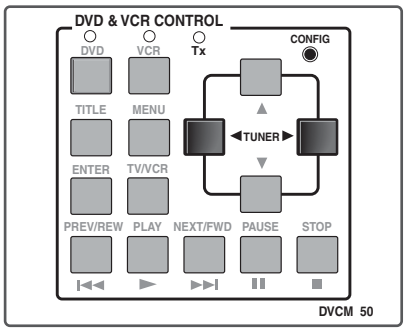
Locking the Front Panel (Executive Mode)

To prevent access by unauthorized users, or accidental button presses to issue unwanted commands to devices, the front panel controls can be locked using executive mode. When the DVCM 50 is in executive mode, all front panel functions are locked, so that pressing the buttons has no effect.

- To enable executive mode, press and hold the Tuner ◀ and ▶ buttons simultaneously for 5 seconds. When the DVCM enters executive mode, the DVD and VCR LEDs light and remain lit.



Buttons for executive mode: press and hold for 5 seconds

- To exit executive mode, press the same two buttons again, holding them for 5 seconds. The DVCM 50 reverts to its last operating mode prior to entering executive mode.

Configuration and Operation, cont'd

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Chapter Four

Special Application

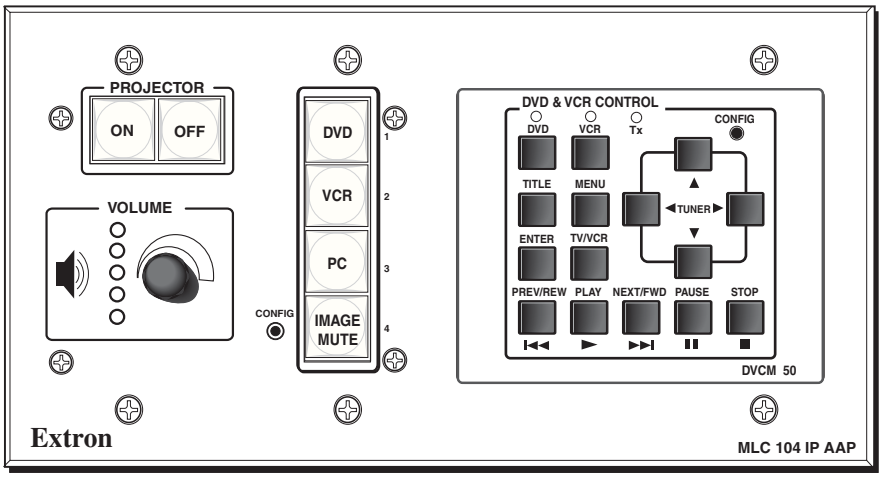
Connecting the DVCM 50 to the MLC 104

Input Selection

Using the IR 452 to Control the DVCM 50 and the MLC 104

Special Application

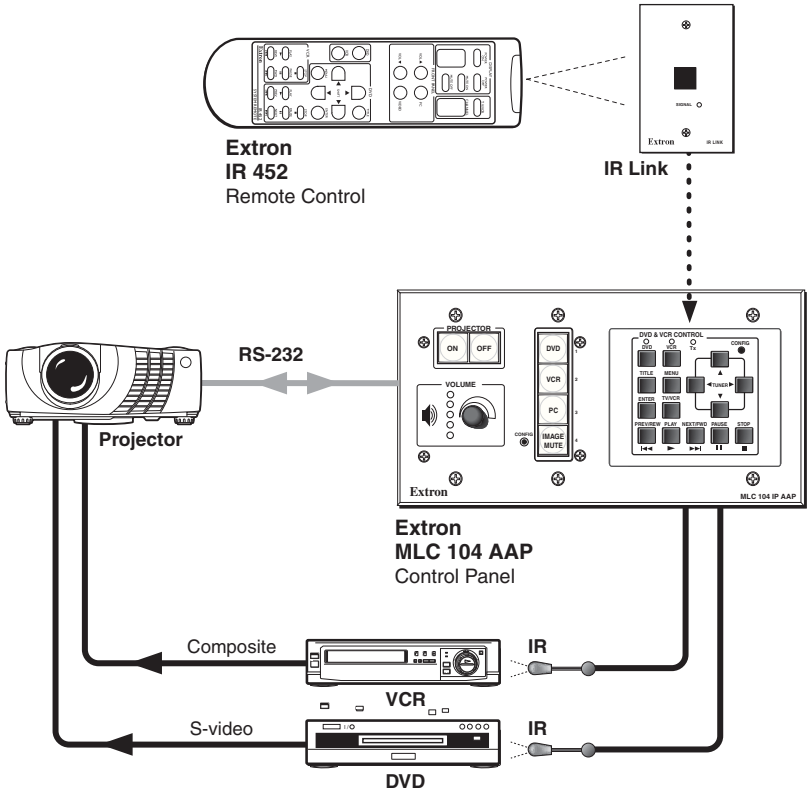
The DVCM 50 can be used with the MLC 104 MediaLink Controller to control a VCR and/or a DVD player. The DVCM can be mounted in the opening of the MLC 104 AAP model's faceplate (shown below), or the two products can be mounted separately.



MLC 104 AAP with DVCM 50 mounted

The combination of these two products is very useful for the following reasons:

- It provides DVD/VCR control for an MLC 104 system.
- It provides IR control of the MLC 104 when the DVCM 50 is used with an IR Link or IRL 20.



Application diagram of the MLC 104 and the DVCM 50 controlled by the IR 452

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Connecting the DVCM 50 to the MLC 104

The DVCM 50 has a 3-pole RS-232 connector on the rear panel that is used to connect the DVCM to the MLC 104. Connect a cable from the DVCM's 3-pole host port to the MLC 104's host configuration port as described below.

1. Cut the required length of Extron Comm-Link 3-wire cable to go between the MLC 104 and the DVCM 50.
2. Using the diagram below as a guide, attach the provided 3.5 mm, 3-pole captive screw connector to one end of the cable, and attach the other end of the cable to the MLC 104 Host Config direct insertion captive screw connector.

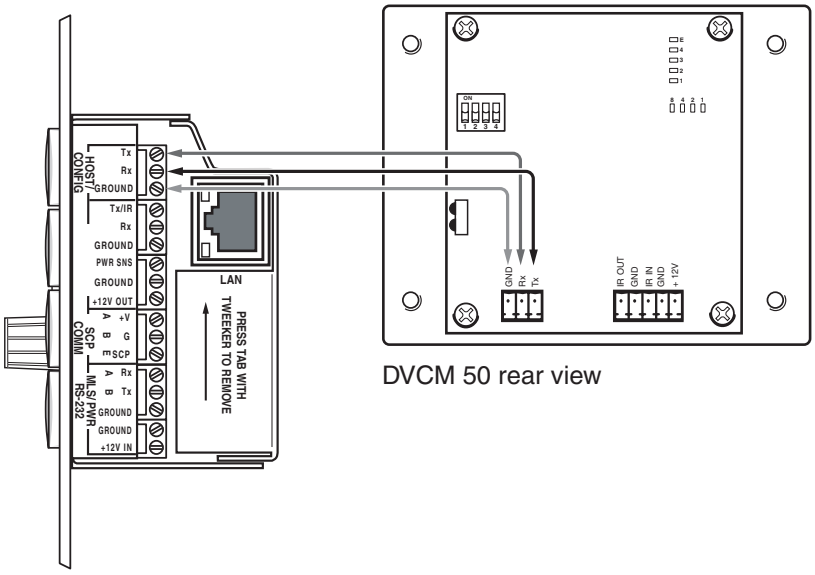
   The wires should be connected as follows:

   - DVCM **Gnd** to MLC **Ground**
   - DVCM **Tx** to MLC **Rx**
   - DVCM **Rx** to MLC **Tx**

NOTE *The wire connecting the MLC 104 to the DVCM 50 should not exceed 25 feet.*

3. Plug the 3-pole connector into the DVCM's 3-pole host port on the rear panel.

NOTE *Connectors are included with the DVCM 50, but the cable must be purchased separately. See appendix A for cable part numbers.*



Connecting the DVCM 50 to the MLC 104

Input Selection

Whichever input the MLC 104 is using, DVD or VCR, the DVCM 50 is in the equivalent mode. Conversely, whichever mode (DVD or VCR) the DVCM 50 is in, the MLC 104 is using the corresponding input. (For example, if the MLC 104 is using the DVD input, the DVCM 50 is in DVD mode, and vice versa.)

For this to occur, the MLC 104 and DVCM 50 must be connected as shown in the illustration above, and the buttons must be configured correctly (see *Setting up buttons for DVD and VCR selection*, on the next page, for information on programming the MLC 104's buttons).

Special Application, cont'd

When the MLC 104 is connected to the DVCM 50, you can select between the VCR and the DVD player by two methods:

- Pressing an input button on the MLC 104
- Pressing the DVD or VCR button on the DVCM 50.

NOTE *You do not need to press both an MLC 104 button and a DVCM button to select the VCR or DVD player.*

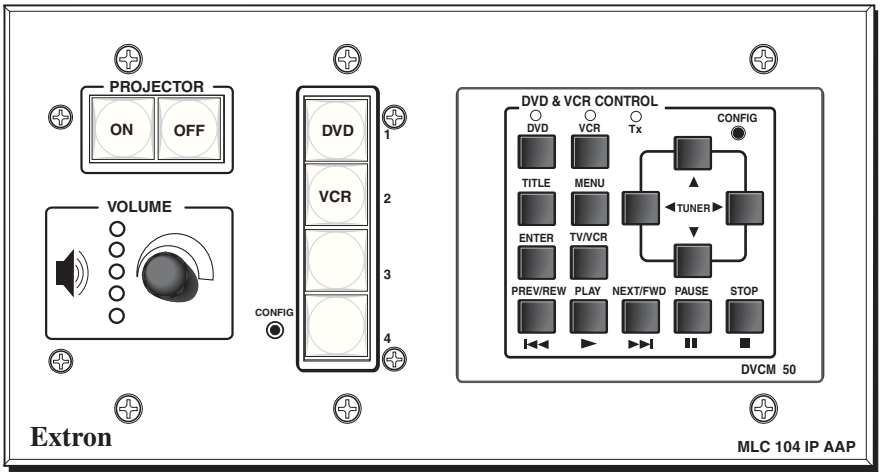
Setting up buttons for DVD and VCR selection

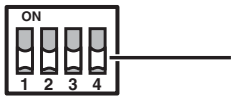
On the MLC 104, you must specify one pair of input buttons that will be used to select the VCR or the DVD player. You can select **either** buttons 1 and 2, **or** buttons 3 and 4 (you cannot use both pairs to select the DVD/VCR). Buttons 1 and 3 select DVD mode, and buttons 2 and 4 select VCR mode. Pressing these buttons activates the DVCM 50's DVD or VCR buttons, which select the input device.

NOTE *The DVD and VCR buttons on the DVCM 50 do not need to be specified or programmed to select the DVD or VCR. These buttons are preset to switch the system to DVD and VCR mode when pressed, and their settings cannot be changed.*

To select the DVD/VCR pair of input buttons, set configuration DIP switch #4 on the DVCM 50 rear panel as follows:

- Place switch #4 in the Off (down) position to use button 1 to select the DVD and button 2 to select the VCR.
- Place switch #4 in the On (up) position to use button **3** to select the DVD and button 4 to select the VCR.





DVCM 50 switch #4 is set to Off (down) position, selecting buttons 1 and 2.

DVD and VCR mapped to input buttons 1 and 2 on the MLC 104

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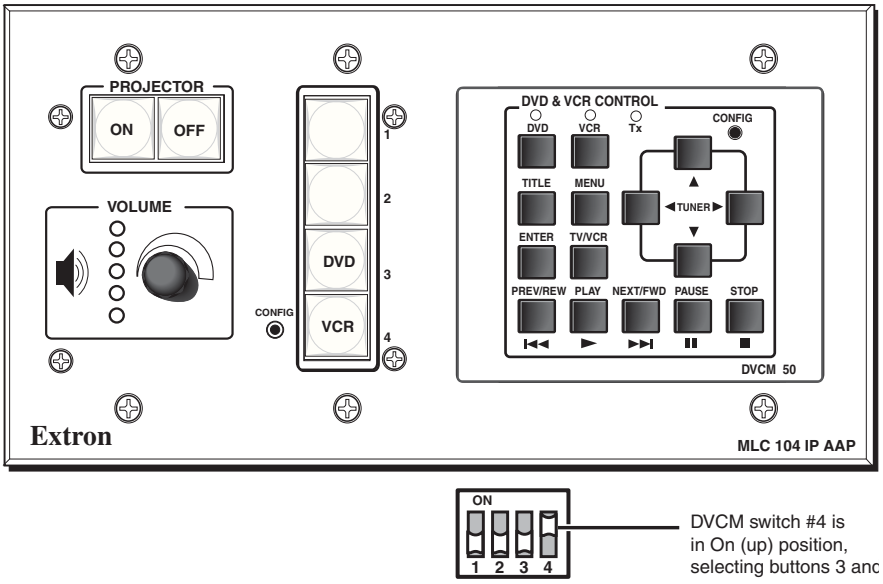
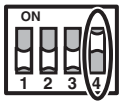


DVD and VCR mapped to input buttons 3 and 4 on the MLC 104

Setting up input selection

To set up for DVD/VCR selection by the MLC 104, do the following:

1. Program the MLC 104 buttons 1, 2, 3, and 4 to select inputs. Refer to your *MLC 104 User's Manual* for instructions on programming buttons.
2. Place a DVD and a VCR label on buttons 1 and 2, **or** 3 and 4. (Refer to your *MLC 104 User's Manual* for the labeling procedure.)
   - You cannot use the same button for both DVD and VCR when the MLC 104 is connected to a DVCM 50.
   - Buttons 1 or 3 must be used for DVD selection; buttons 2 and 4 must be used for VCR selection.
   - Buttons 1 and 2 **or** buttons 3 and 4 must be used together for DVD/VCR selection. (You cannot pair buttons 1 and 4 or buttons 2 and 3 together.)
3. Set configuration switch #4 on the rear panel to On or Off to select the pair of buttons you programmed and labeled for DVD and VCR selection. (See *Setting up buttons for DVD and VCR selection*, earlier in this chapter, for more information on settings for this switch.)



4. Program the remaining two input buttons on the MLC 104 as desired to select another input (such as a laptop) or to perform another function (such as Auto Image).

NOTE *For best results, do not use an SCP 104 in a system consisting of an MLC 104 and a DVCM 50.*

Using the IR 452 to Control the DVCM 50 and the MLC 104

The MLC 104 can be controlled by the IR 452 via the DVCM 50 in conjunction with the IR Link or IRL 20.

In order to provide IR control of the MLC 104, you need the following components:

- IR 452
- IR Link or IRL 20
- DVCM 50

Enabling IR 452 control of the MLC 104

To set up the MLC 104 for control by the IR 452, do the following:

1. Program the buttons on the MLC 104 and the DVCM 50 front panels with the desired commands. (Refer to the *MLC 104 User's Manual* for instructions on programming its buttons. See chapters 3 and/or 5 for information on programming the DVCM 50 buttons.)
2. Connect the DVCM 50 rear panel host port to the MLC 104 rear panel host port. (See *Connecting the DVCM 50 to the MLC 104*, earlier in this chapter.)
3. Connect the IR Link or the IRL 20 to the DVCM 50 rear panel. (See *Wiring for IR remote control*, in chapter 2.)
4. Mount the MLC 104, the DVCM 50, and the IR Link or IRL 20 on a wall or furniture as desired. (Refer to the mounting instructions in the *MLC 104 User's Manual*.)

Controlling the MLC 104 with the IR 452

The IR 452 controls the MLC 104 through the IR Link or IRL 20 and the DVCM 50, which is connected to the MLC 104 rear panel host port.

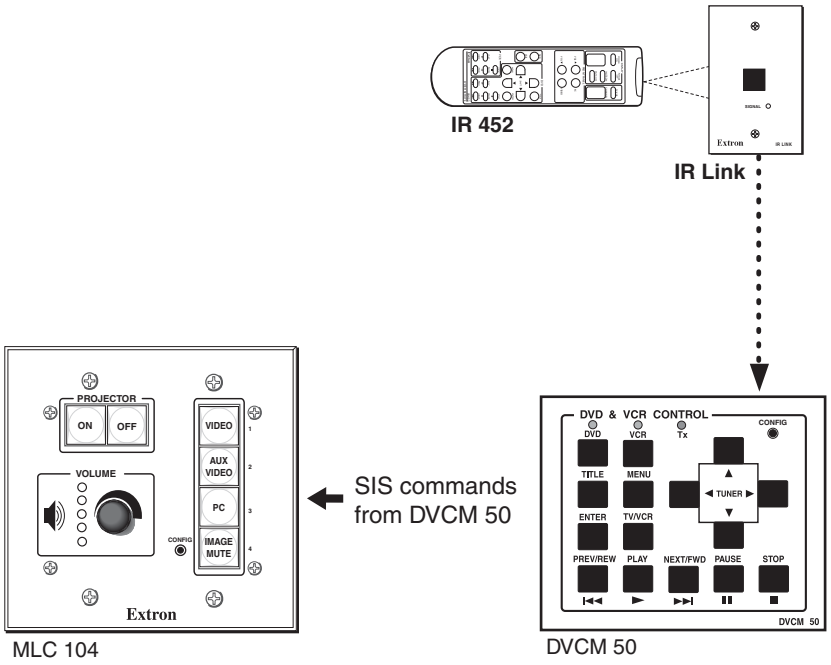
IR 452 to MLC 104 communication process

The following occurs when you press a button on the IR 452:

1. An IR signal associated with the button goes from the IR 452 to the IR Link or IRL 20, then to the DVCM.
2. The DVCM 50 interprets the IR signal and responds to it by sending the appropriate SIS command to the MLC 104.

NOTE *You do not need to program any buttons on the DVCM 50 for it to interpret the signals it receives from the IR 452.*

NOTE *The DVCM 50 is configured to automatically send commands to the MLC 104. No additional configuration is needed to operate the DVCM with the MLC 104.*

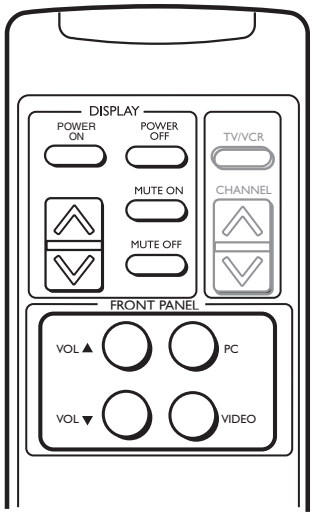


Remote control of the MLC 104

3. The MLC 104 activates the button on its front panel that is associated with the SIS command it receives. When the button is activated, the command programmed to it is sent to the projector or display device.

Buttons and commands used with the MLC 104

To control the MLC 104, you use the buttons in the Display and Front Panel sections of the IR 452. (See the illustration below.)



Buttons on the IR 452 (top portion) that are used with the MLC 104

Special Application, cont'd

The table below shows the SIS commands that the DVCM 50 issues to the MLC 104 for each press of an IR 452 button, and the button that is activated on the MLC 104.

NOTE *You must program the desired commands onto the MLC 104's front panel buttons, using the Global Configurator software, in order for the MLC to send the correct command to the projector.*

IR 452 Button Name	IR 452 Section	SIS Command from DVCM 50	MLC 104 Button/ Function Activated
Power On	Display	1P	On
Power Off	Display	0P	Off
Vol ▲	Front Panel	1!	Input selection button 1
PC	Front Panel	2!	Input selection button 2
Vol ▼	Front Panel	3!	Input selection button 3
Video	Front Panel	4!	Input selection button 4
Volume Up (arrow)	Display	+V	Volume control knob Increase
Volume Down (arrow)	Display	–V	Volume control knob Decrease
Mute On	Display	1M	Audio/video muting on (No button equivalent)
Mute Off	Display	0M	Audio/video muting off (No button equivalent)

For example, the first row of the table above shows that when you press the Power On button in the Display section of the IR 452, the signal sent to the DVCM 50 is interpreted as the SIS command **1P**. This command is sent to the MLC 104 to activate the button that is labeled On (in the Projector section). The MLC 104 responds by issuing the command to the projector to turn on.

NOTE *Once you have programmed and labeled the buttons on the MLC 104, you should relabel the IR 452 buttons to indicate the commands they will initiate on the MLC 104. Refer to your IR 452 User's Manual for information on labeling buttons on the remote control.*

Muting and unmuting

The MLC 104 does not have buttons that control muting and unmuting on the display device. However, you can program Mute On and Mute Off commands onto the MLC 104 using the Global Configurator (GC2) software. (Visit the Extron Web site at www.extron.com for information on ordering the GC2 software.)

Depending on the feature set of your display device, you can program the MLC 104 to mute/unmute the video, audio, or both.

To use the IR 452 to control muting/unmuting, press the Mute On or Mute Off button in the Display section. Pressing these buttons causes the DVCM 50 to send an SIS command (1M for Mute On button or 0M for Mute Off button) to the MLC 104, causing it to mute or unmute the display device.

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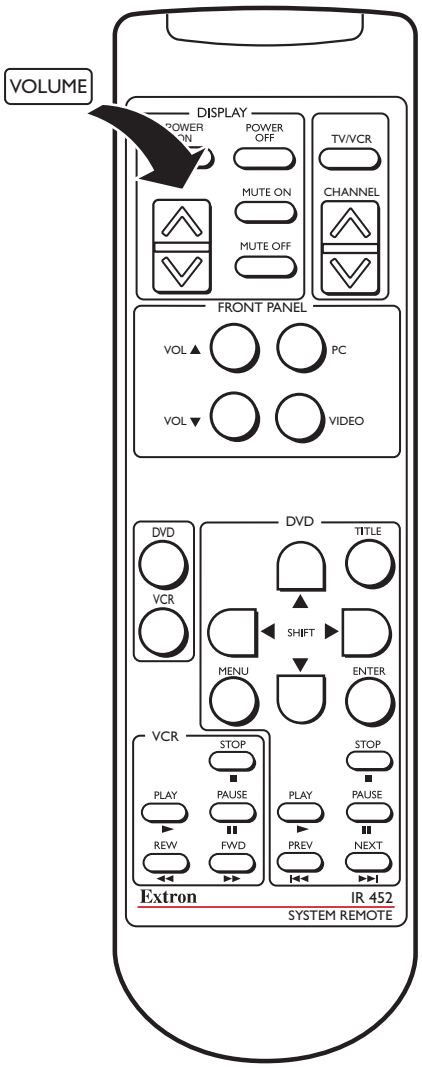
Volume control on the MLC 104

To control the volume on the MLC 104 using the IR 452, press the rocker button in the Display section. Pressing the up or down arrow on this button causes the DVCM 50 to send a +V or –V SIS command to the MLC 104, which responds by increasing or decreasing the volume on the display device.

Remove the Volume label from the sheet of labels provided with the IR 452, and affix it above the arrow rocker button on the IR 452 front panel as shown in the illustration below.



Labeling the MLC 104 Volume buttons on the IR 452

Special Application, cont'd

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DVCM 50 DVD/VCR Control Module

5

Chapter Five

Software-based Configuration and Control

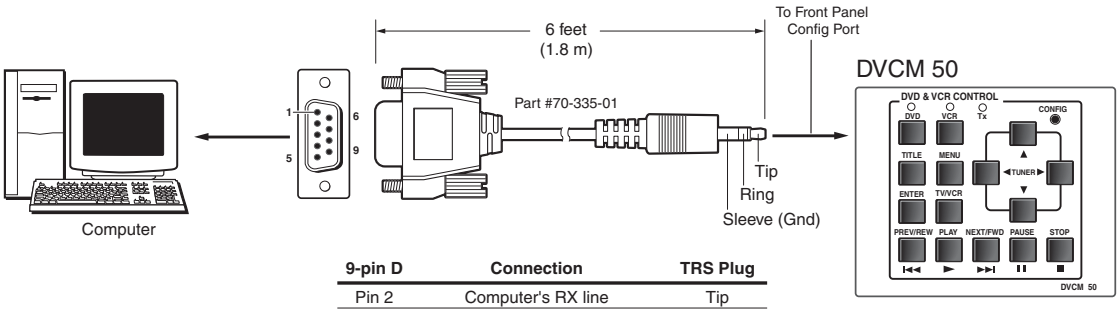
Using the Windows®-based Configuration Software

Using Simple Instruction Set (SIS™) Commands

Software-based Configuration and Control

The DVCM 50 can be remotely configured via a host computer connected to the front panel configuration port. Through this port, you can program the DVCM's buttons with commands by using the Windows®-based configuration software (MLC 52/DVCM 50 Control Program). The optional 9-pin D to 2.5 mm stereo mini TRS RS-232 cable (part #70-335-01) can be used for this connection.

The connector has the following pin assignments:



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

RS-232 configuration cable pin assignments

The DVCM 50 uses the following protocol:

9600 baud 1 stop bit
8 bits Flow control: None
Parity: None

Using the Windows®-based Configuration Software

Extron's MLC 52/DVCM 50 Control Program Windows-based configuration software, included with your DVCM 50, provides a convenient way to program all the DVCM buttons, in both DVD and VCR mode. This configuration program's graphical user interface includes the same functions as those on the DVCM's front panel, plus the ability to download IR drivers for a wide range of A/V devices.

NOTE *This software program only configures the DVCM 50 buttons. It does not control the DVCM itself. In other words, you are not able to click buttons on the screen to make the DVCM switch modes, start or stop the VCR, etc.*

To install and run the DVCM 50 configuration program software, ensure that your PC meets the following minimum requirements:

- Windows 2000, XP, or higher
- 400 MHz processor
- 32 MB free hard disk space

Extron's Windows-based configuration software is provided on CD with the DVCM, and updates can be downloaded from the Extron Web site (http://www.extron.com).

In order to use the configuration software with the DVCM, your PC must be connected to the DVCM 50 front panel configuration port by the optional 9D-2.5 mm TRS serial cable, described above.

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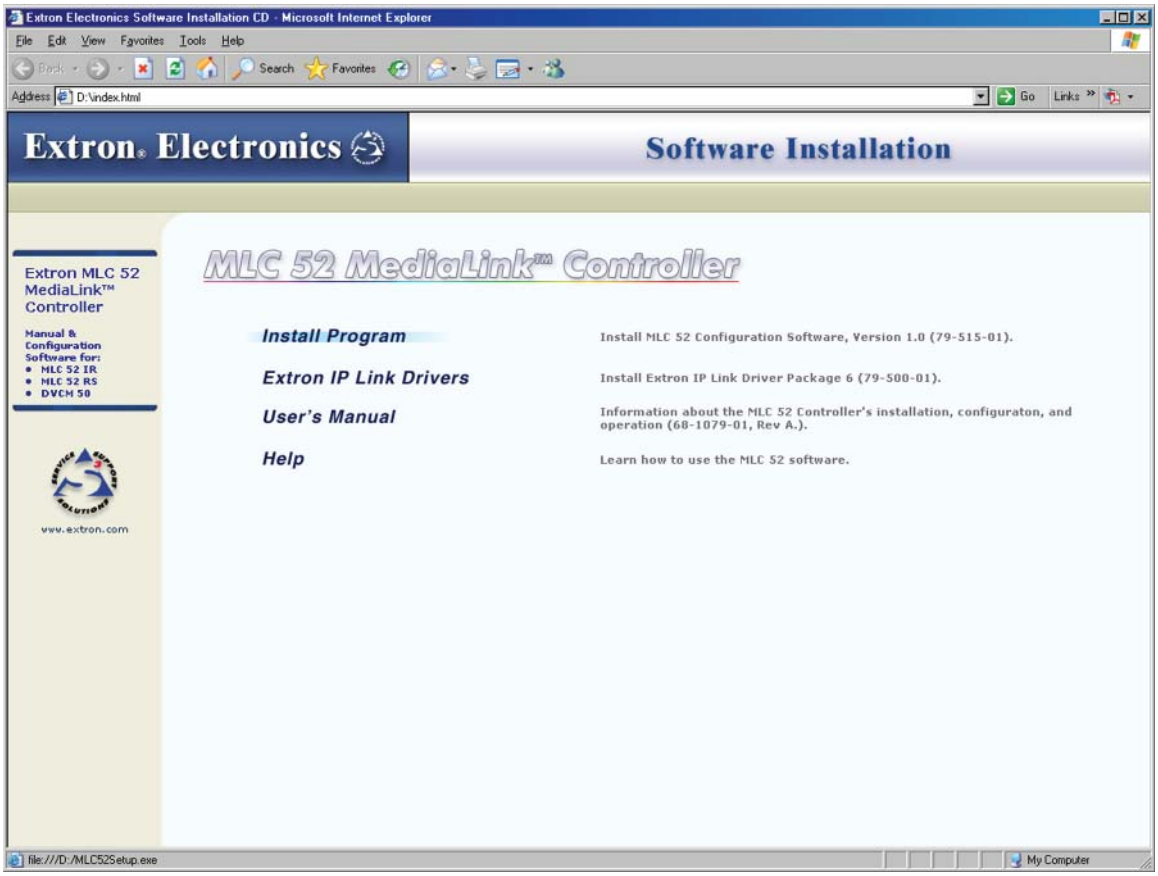
Installing the software

The installation process has two parts: installing the software and installing the IP (IR) drivers. The files you will install need approximately 32 MB (megabytes) total of hard disk space.

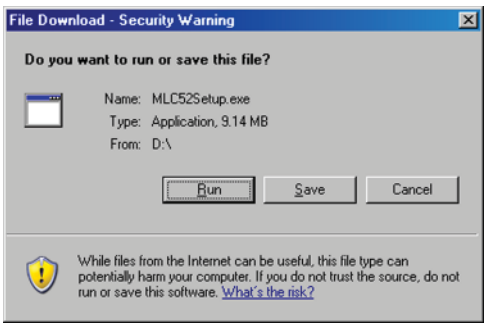
To install the software and IR drivers onto the PC hard drive, follow these steps.

1. Insert the CD ROM into your CD drive. The disk should start automatically. If it does not, run LAUNCH.EXE from the CD.
2. On Software Installation screen, click Install Program.


Extron Electronics Software Installation CD - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address D:\index.html
Extron Electronics
Software Installation
Extron MLC 52 MediaLink™ Controller
Manual & Configuration Software for:
MLC 52 IR
MLC 52 RS
DVCM 50
www.extron.com
MLC 52 MediaLink™ Controller
Install Program
Install MLC 52 Configuration Software, Version 1.0 (79-515-01).
Extron IP Link Drivers
Install Extron IP Link Driver Package 6 (79-500-01).
User's Manual
Information about the MLC 52 Controller's installation, configuraton, and operation (68-1079-01, Rev A.).
Help
Learn how to use the MLC 52 software.
file:///D:/MLC52Setup.exe
My Computer

Software Installation screen on the DVCM 50 CD

3. On the File Download window that appears, click Run to begin installing the program.


File Download - Security Warning
Do you want to run or save this file?
Name: MLC52Setup.exe
Type: Application, 9.14 MB
From: D:\
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?

File Download window

Software-based Configuration and Control, cont'd

If you would like to save the installation file (MLC52Setup.exe) to your desktop, click Save. On the Save As window, save the setup file to the desired location. When you are ready to install the software, double-click on the MLC52Setup.exe file to open it and begin the installation procedure.

3. A Security prompt appears. Click Run on this window to continue with the installation.

4. Follow the instructions on the InstallShield Wizard screens to complete the program installation.

   By default the installation creates a folder called "MediaLink" in the following location on the PC:

   \Program Files\Extron\MediaLink

   The following two icons are placed in the MediaLink folder:

   - MediaLnk52.exe (MediaLink configuration program)
   - MediaLnk52.hlp (MediaLink Help program)

   If there is no Extron folder in your Program Files folder, the installation program creates it as well.

5. Return to the Software Installation screen, and click Extron IP Link Drivers.

6. Click Run on the File Download window, then click Run again on the Security prompt window.

7. Follow the instructions on the Driver InstallShield Wizard screens to complete the driver installation.

   By default, the installation places a folder called Driver 2 containing the set of IR drivers in the Extron folder under Program Files. If your Program Files folder does not contain an Extron folder, the installer creates that as well.

Starting the configuration program

Many items in the DVCM 50 configuration program can also be configured via the front panel, described in chapter 3. Refer to that chapter for details on features and settings. The MediaLink Help Program provides information on settings and on how to use the configuration program itself.

1. To run the MLC52/DVCM 50 configuration program, do either of the following:

   - Double-click on the MediaLink52.exe icon, located on your PC at:

     \Program Files\Extron\MediaLink

   - Access the program from the Start menu on your PC:

     a. Click Start on your PC screen.

     b. Select All Programs from the Start menu.

     c. From the All Programs menu, select Extron Electronics.

     d. From the Extron menu, select MLC 52 + DVCM 50.

     e. Select MLC 52 + DVCM 50 Control Program. The Comm Port Selection window appears.

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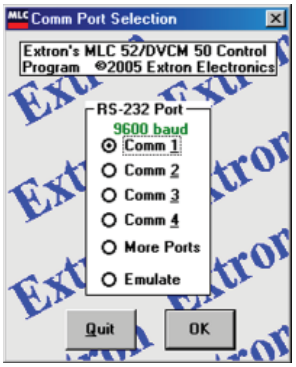
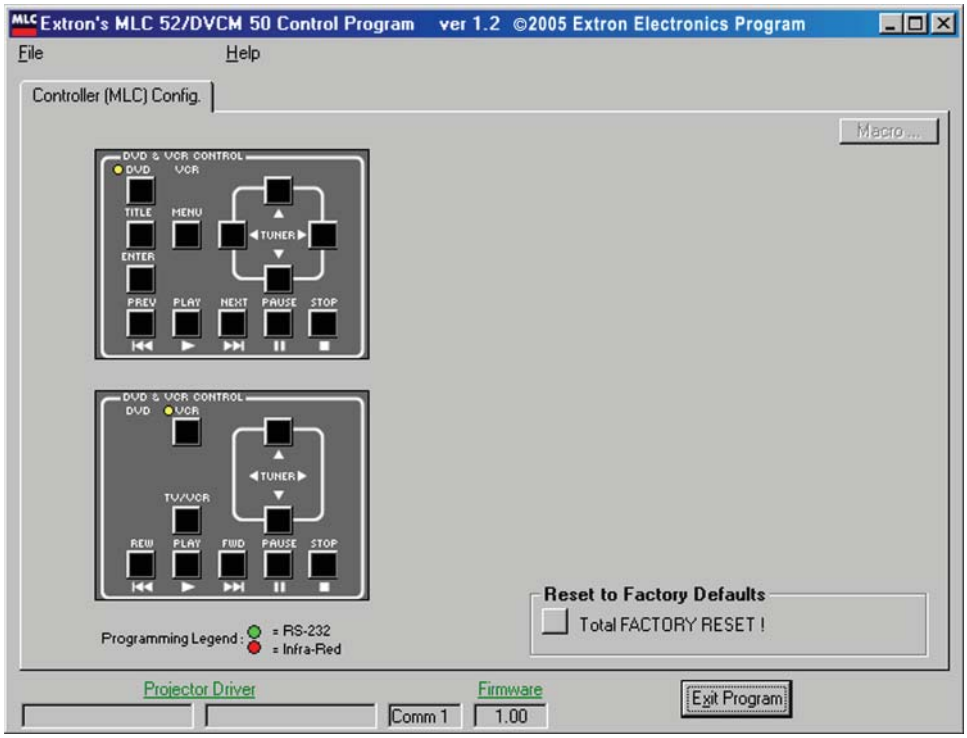


Comm Port Selection menu

NOTE *The text field near the top of the Comm Port window shows "MLC 52/DVCM 50 Control Program" as the name of the software, and this program is used with both the MLC 52 and the DVCM 50. When the software is opened, it detects your DVCM 50 connection to the PC and displays the DVCM 50 screen.*

2. Select the comm port through which your computer will communicate with the DVCM 50.
3. Click OK. After a few seconds, the Extron DVCM 50 configuration program screen appears, displaying the Controller (MLC) Config. tab. (The DVCM 50 screen has only this tab.)

Overview of the DVCM 50 configuration program screen



The DVCM 50 configuration program screen

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The DVCM 50 configuration program main screen contains the following:

- **Diagrams of the DVCM 50** in DVD and VCR mode, on which you click the buttons to access the IR drivers that enable you to program commands on the equivalent DVCM 50 buttons.
- **Two pull-down menus:**

  File menu — Provides options to save and restore configurations and to update the DVCM firmware.

  Help menu — Displays the MLC 52/DVCM 50 Help, which provides information on procedures for performing all tasks required to configure the DVCM 50 using the configuration software.
- **Total Factory Reset button:**

  Click this button to reset the DVCM to the original settings with which it was delivered from the factory.

  NOTE *This does not reset the unit's firmware.*
- **The communication port and firmware version** information are displayed at the bottom of the screen. (The Projector Driver fields do not apply to the DVCM 50.)
- **Exit Program button:**

  Click this button to exit the DVCM 50 configuration program and close the main screen.

Using the Help program

For information on program features, do one of the following to display the context-sensitive DVCM 50 online Help:

- From the Help menu on the DVCM 50 configuration program screen, select Contents.
- Press the F1 computer key.
- Double-click on the MediaLnk52.hlp file in the MediaLink52 folder on your PC hard drive.

For explanations of buttons or functions, click on the tabs in the help screen to reach the desired screen. Use a mouse or the Tab and Enter keys to select a button/function. A description and tips on using the program appear on the screen.

About Extron drivers

Extron drivers are control files (libraries) of Extron-created IR commands that are specific to a particular DVD or VCR. When you install your DVCM 50 configuration software, you must also install the IR drivers, which also are provided on the software CD. Before using the configuration software to configure the DVCM's buttons, you must load the appropriate driver for your VCR or DVD player to the DVCM 50.

NOTE *The DVCM 50 is compatible with IP Link IR drivers found on the IPL Driver Package, version 6 or higher.*

NOTE *Pre-configured control files (drivers) should be used whenever possible. If no driver is available for the DVD or VCR you want to control, it is possible to create your own driver via IR Learning (see* Programming the DVCM 50 Using IR*, in chapter 3).*

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Key to file names

File name	Description
_____.MLK	User-saved DVCM/MLC/MLC-MLS/MLS configuration file. This includes adjustments/settings and whatever driver (if any) was installed in the DVCM at the time the file was saved.
_____.EIR	IP Link IR drivers

Configuring the control module

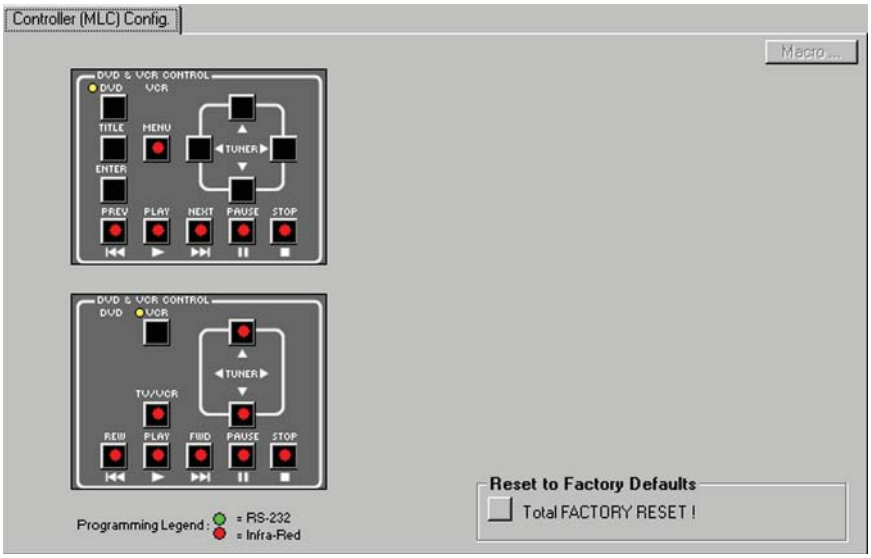
The DVCM 50 screen, shown below, is where you configure the control module and initiate IR Learning through software. This screen lets you perform IR Learning of commands to DVCM button memory blocks, pick and assign IR driver functions to memory blocks, remove programming from buttons, and configure buttons in toggle and macro modes.

Overview of the Controller (MLC) Config. tab

The DVCM 50 screen contains one tab: Controller (MLC) Config. This tab contains graphical representations of the DVCM 50 in DVD mode and in VCR mode. When you click on the button representations in these diagrams, menus are displayed, enabling you to configure the DVCM buttons.

The Programming Legend below the DVCM 50 diagram shows that a red dot on a button means that an IR code has been learned for one or more of that button's memory blocks. (Because RS-232 commands cannot be programmed on the DVCM 50, green dots do not appear on these diagrams.)

If the button does not contain a red dot, no commands have been stored on that button.



The DVCM 50 screen with buttons programmed with IR commands

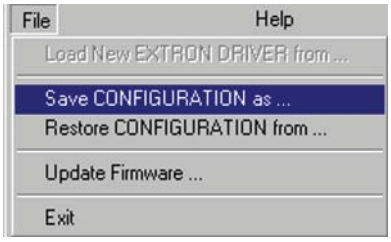
Software-based Configuration and Control, cont'd

Saving and restoring the configuration

Before programming any buttons, you may want to save the DVCM 50's current configuration in case you want to restore those settings in the future.

Saving a configuration

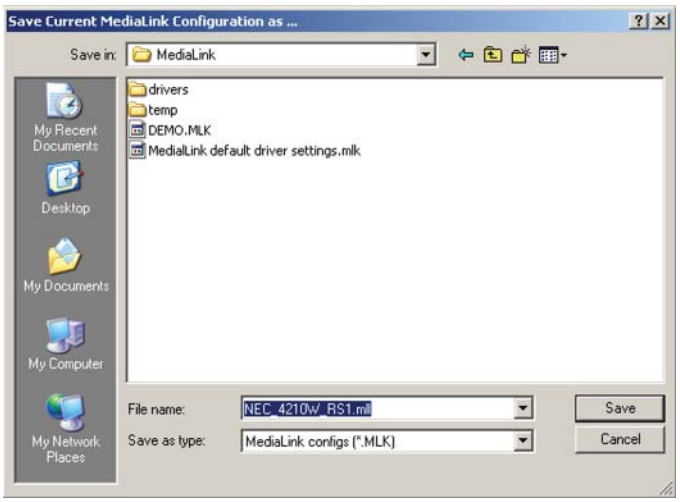
1. From the File menu, select Save CONFIGURATION as... .



File menu

The "Save Current MediaLink Configuration as..." window opens.

2. If necessary, browse to locate the folder in which you want to save your configuration. (It is recommended that you save it in the MediaLink folder, or in another directory where the file can be found easily.)
3. Make sure the Save as type field is set to MediaLink Configs (*.MLK).
4. Enter a name for the configuration in the File name field, in the format *filename*.mlk.



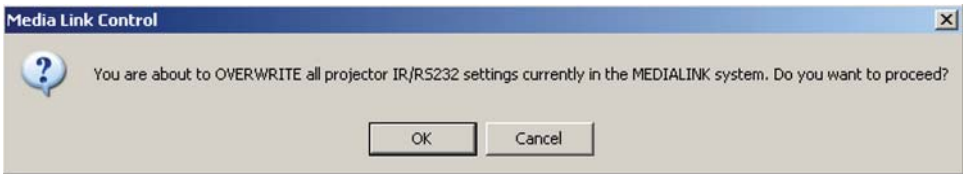
Save Current MediaLink Configuration as... window.

5. Click Save. The current configuration is saved as a file with a .mlk extension.

Restoring a configuration

Restoring a configuration allows the software to quickly program a DVCM 50 from an existing configuration. To restore a configuration, follow these steps:

1. From the File menu, select Restore CONFIGURATION from... . The following confirmation prompt opens:


Media Link Control
You are about to OVERWRITE all projector IR/RS232 settings currently in the MEDIALINK system. Do you want to proceed?
OK
Cancel

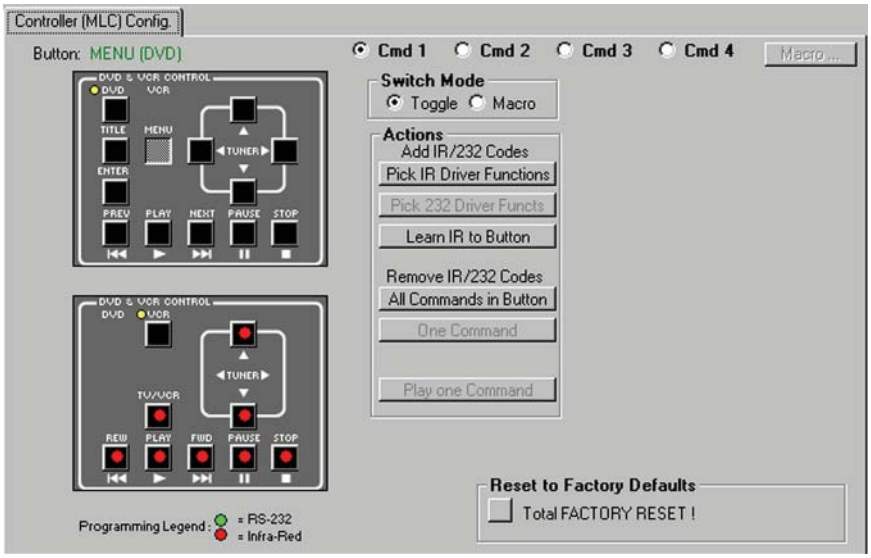
Restoring configuration confirmation prompt

2. Click OK. The Restore Saved MediaLink Configuration from... window opens.
3. If necessary, browse to locate the configuration file that you want to restore. Configuration files are usually stored in the MediaLink folder.
4. Select the desired configuration file. It must have a **.mlk** extension.
5. Click Open. After a few seconds, the saved configuration is uploaded to the DVCM 50.

Assigning command functions to buttons

IR drivers are used to configure the DVCM 50. Each button has four memory blocks that can be programmed with commands. Follow these steps to program the DVCM's memory blocks with IR commands:

1. On the DVD or VCR mode diagram, click the button to which you want to add a command. In the example below, the Menu button was selected in the DVD mode (top) section.



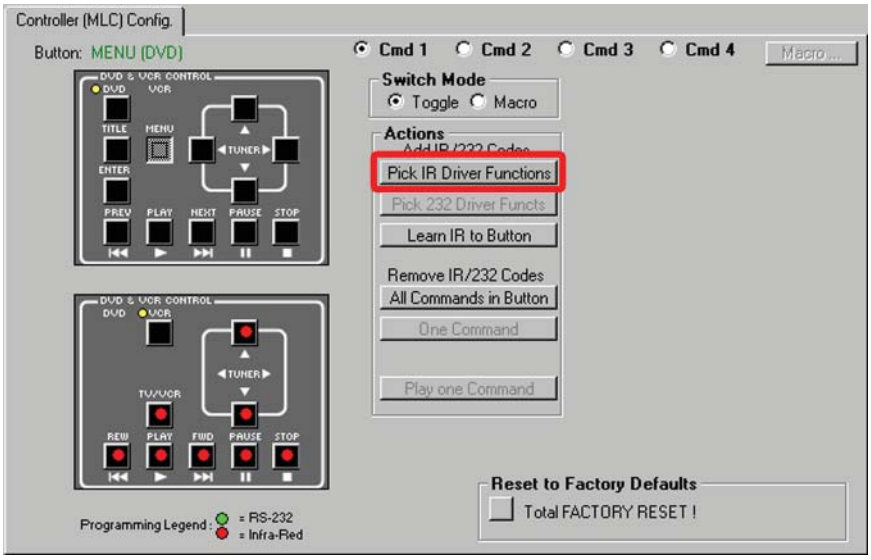
Menu button selected on the DVD mode diagram

Software-based Configuration and Control, cont'd

When you select a button, the following occurs on the screen:

- The selected button turns gray. The Button field above the DVD mode diagram displays the name of the button and the mode (DVD, in this example) that were selected.
- Radio buttons for the selected button's four command memory blocks (Cmd 1 through Cmd 4) are displayed at the top of the tab. The radio button for the memory block you are currently programming is selected.
- Switch Mode and Actions buttons are displayed in a column down the center of the tab.

2. Click the Pick IR Driver Functions button in the Actions section.



Pick IR Driver Functions button on Controller (MLC) Config. tab

The Driver Selection window is displayed on top of the Controller (MLC) Config. tab.

3. In the Driver Selection window, make selections in the following list boxes (see the illustration on the next page):

Driver Category — Type of product to be controlled. This should be a DVD player, a VCR, or a combination DVD/VCR.

Device Models — Model name/number of your projector or other display device. When you select a model, the fields below the Device Models section display the selected driver's version and origin (Status):

- **Released:** The driver was created by Extron.
- **User-Learned:** The driver was created by a user or another non-Extron person.

Functions Available in Driver — Functions that the selected button can be programmed to perform

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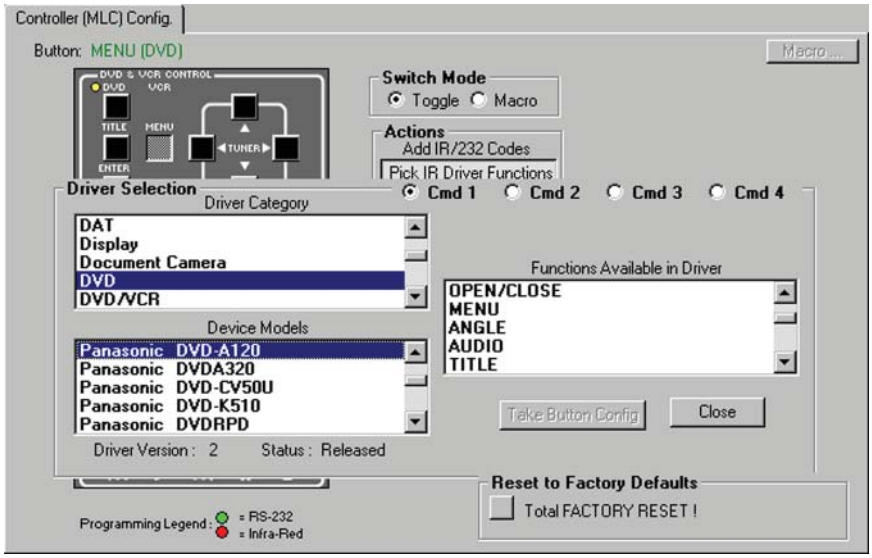
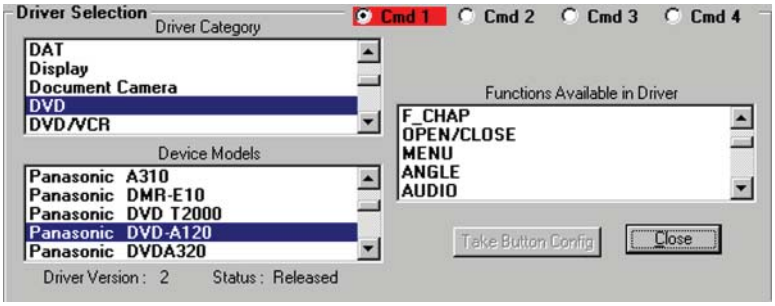


Driver Selection window

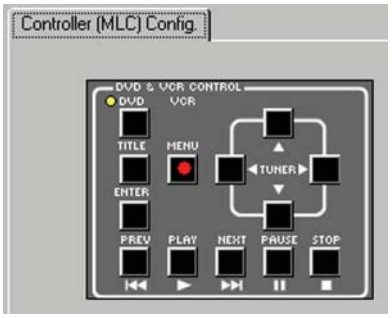
4. Click the Take Button Config button to implement your selections. The command is programmed into the button's selected memory block.

   - On the Driver Selection window, the radio button for the command memory block you just programmed is surrounded by a red field. This indicates that the block contains an IR command.



Driver Selection window showing that memory block 1 (Cmd 1) contains an IR command

   - On the DVCM – DVD diagram, a red dot appears on the button you programmed.



DVD mode diagram showing Menu button programmed

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Software-based Configuration and Control, cont'd

5. If you want to assign another command to the same button, select the next Cmd radio button, then repeat steps **3** and **4**.

For each button, you can perform this procedure up to four times, until the button's four memory blocks are all assigned.

NOTE *You must program the next command in order. You cannot, for example, program memory block #1 (Cmd 1 radio button) then skip to block #3 or #4.*

NOTE *You can mix driver functions from different devices on the same button. For example, you can program the Play button (in DVD mode) with one command to start a Panasonic DVD player, and another command to start a Sony DVD player.*

6. When finished programming commands to the button, click Close to close the Driver Selection window.

Removing commands from a button

You can remove either one command from a button, or all the button's commands at once.

1. Select the button from which you want to remove commands. The button becomes gray.
2. If you want to remove only one command from the button, select the Cmd radio button for the memory block containing the command to be removed.

   If you want to remove all the commands, you do not need to select a Cmd radio button.
3. Under Remove IR/232 Codes in the Actions field, click one of the following buttons:
   - **One Command** — Removes the command from the selected memory block only.

     NOTE *If you want to remove only one command at a time, you must remove the commands in descending order; e.g., remove command 4 before removing commands 3, 2, and 1.*
   - **All Commands in Button** — Removes all the commands from all the memory blocks on the button.

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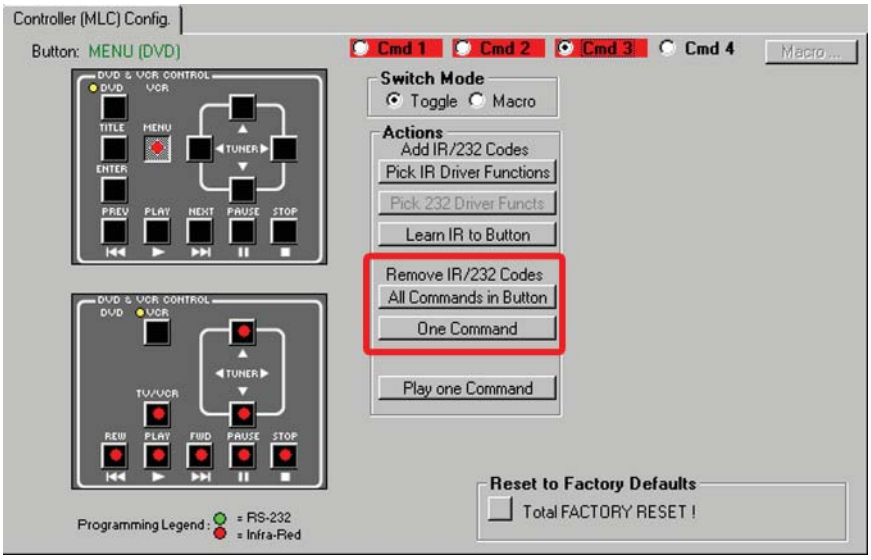


Remove IR/232 Codes buttons

A prompt window like the following appears:

Media Link Control
You are about to REMOVE the IR / RS-232 code for command #3 of the MENU (DVD) button from the MLC 52.
Do you want to proceed?
OK
Cancel

Confirmation prompt for removing one command

4. Click OK. The specified command(s) are removed from the selected button. On the screen, the red field is removed from around the Cmd radio button(s).

Setting up button macros using macro mode

Buttons function in either toggle mode or macro mode. By default, the buttons are in toggle mode, meaning that each time the button is pressed, one of its programmed commands is issued. (Each button can store up to four commands.)

When a button is in macro mode, one press executes all the commands programmed onto that button, in the order they were programmed, at 1.5 second intervals. One example of a button macro application would be pausing multiple DVD players by pressing the Pause button one time.

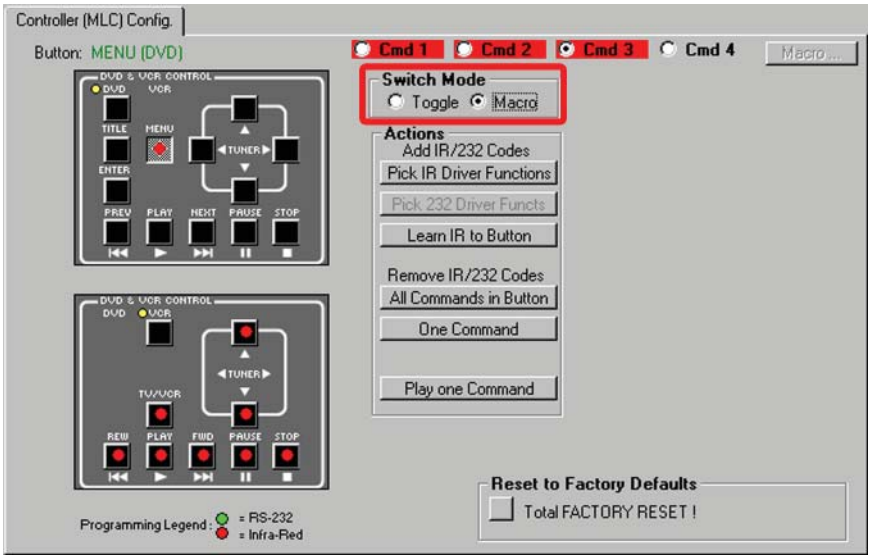
NOTE *Switching to macro mode does not involve the Macro... button in the upper-right corner of the Controller (MLC) Config. tab. This button is not available on the DVCM 50.*

To place a button in macro mode, follow these steps:

1. On the DVCM DVD or VCR diagram, click the button for which you want to enable a macro. The button becomes gray.
2. Program onto the selected button the commands that you want to be part of the macro. See *Assigning command functions to buttons*, earlier in this chapter, for the procedure.

Software-based Configuration and Control, cont'd

3. In the Switch Mode field, select the Macro radio button.



Switch Mode field with Macro selected

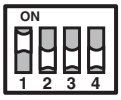
Performing IR Learning via software

The DVCM 50 can "learn" commands from your VCR or DVD player's remote control in order to control the VCR or DVD player. Using IR Learning, you can program command codes to each of the DVCM button's four memory blocks.

NOTE *Buttons must be configures with IR commands before they are placed in macro mode.*

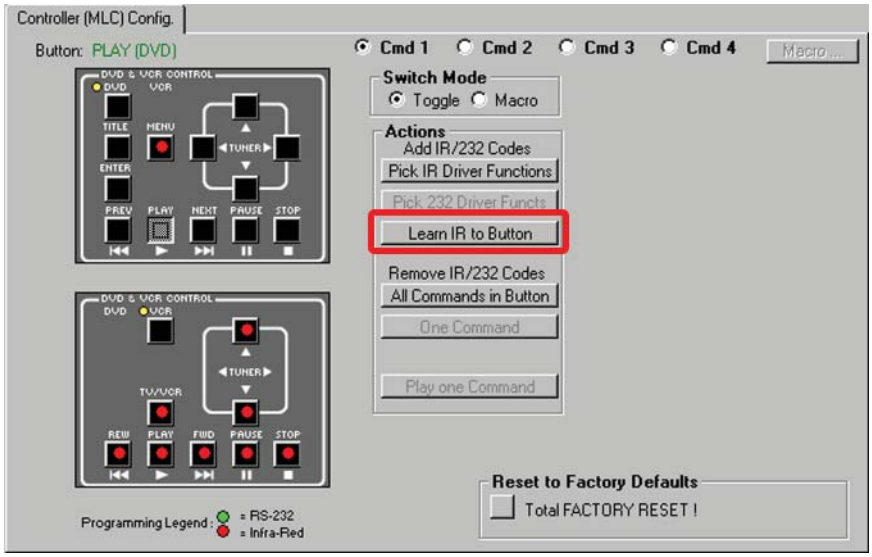
Follow these steps to initiate IR Learning via the configuration program:

1. Set configuration DIP switch #1 on the DVCM rear panel to On (up). See diagram at right.



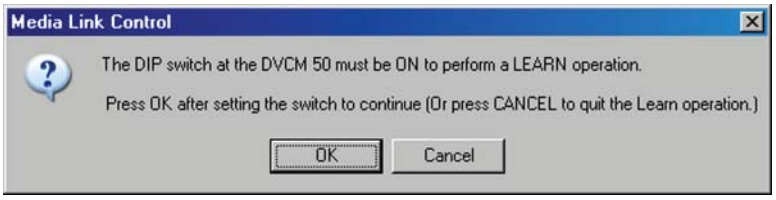
2. Launch the DVCM 50 configuration software.
3. On the DVCM 50 DVD or VCR diagram on the Controller (MLC) Config. tab, select the button for which you want the DVCM to learn IR codes.
4. Select the Cmd radio button for the memory block where you want the command to be stored.

5. Click Learn IR to Button.

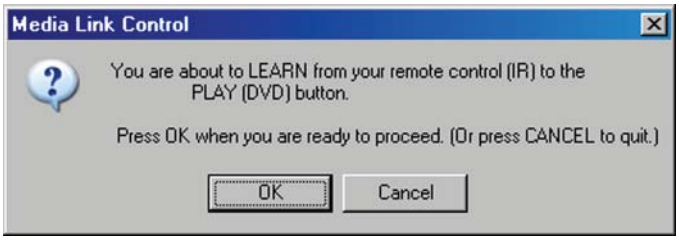


Learn IR to Button on the DVCM 50 screen

If you have not set Configuration Switch #1 to On (step 1), the following dialog box opens, prompting you to do so. Set the switch, then click OK.


Media Link Control
The DIP switch at the DVCM 50 must be ON to perform a LEARN operation.
Press OK after setting the switch to continue (Or press CANCEL to quit the Learn operation.)
OK
Cancel

6. The following dialog box opens, indicating the button to which IR codes will be learned, and to allow you to OK or cancel the IR learning process.


Media Link Control
You are about to LEARN from your remote control (IR) to the PLAY (DVD) button.
Press OK when you are ready to proceed. (Or press CANCEL to quit.)
OK
Cancel

7. When you are ready to start, click OK. A Status of IR Learning message area appears beneath the Actions field, instructing you to aim the DVD or VCR remote control and press the button whose function you want the DVCM to learn.

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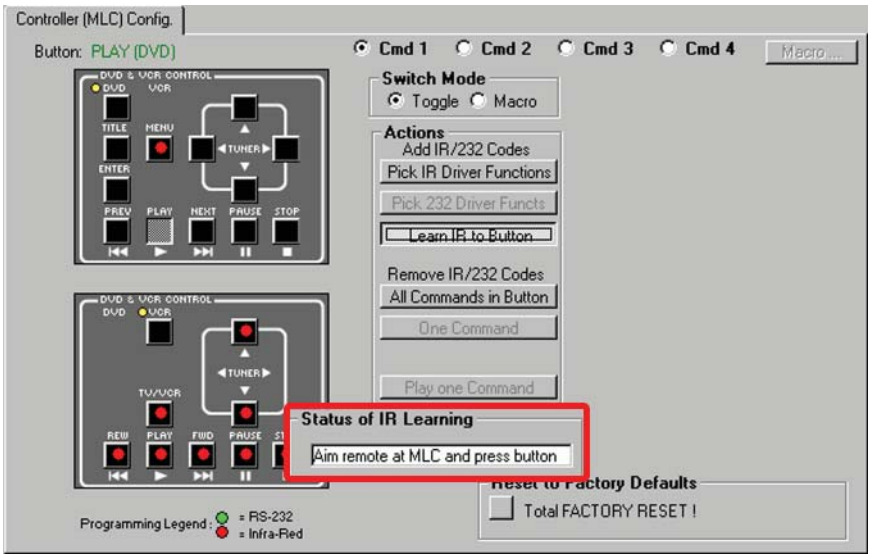
Software-based Configuration and Control, cont'd



Status of IR Learning field with message to aim remote control and press button

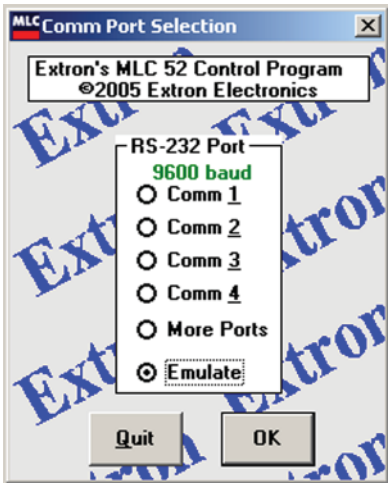
8. Hold the DVD or VCR remote control 4" to 14" (10 cm to 36 cm) away from and directly facing the DVCM's IR Learning LEDs. (You may need to experiment to determine the best IR learning distance for each remote control.) Press the desired button on the DVD or VCR remote within 5 seconds.
   - If the command was learned successfully, the Status of IR Learning message field briefly displays "Learn Succeeded," then disappears.
   - If the command was not learned for any reason, a prompt appears, telling you that the learn failed, and giving you the opportunity to retry or cancel.
9. Repeat steps **3** through **8** for each button to be set up with IR codes.
10. Place configuration DIP switch #1 back in the Off (down) position. (All four switches should be down.)

Using emulation mode

The DVCM 50 configuration program features an emulation mode so that you can set up a DVCM system before equipment is available on site. You can save the emulated settings to a configuration file, then load that configuration file to the DVCM 50 when the actual equipment is available.

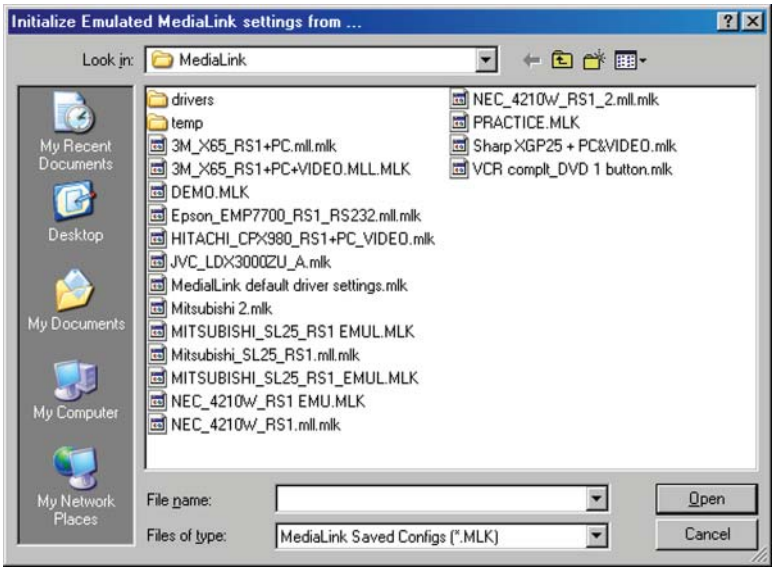
To operate in emulation mode, follow these steps:

1. Start the MLC 52/DVCM 50 configuration program.
2. On the Comm Port Selection screen, select the Emulate radio button, then click OK.



Comm Port Selection screen with Emulate selected

The Initialize Emulated MediaLink Configuration from... dialog box opens.



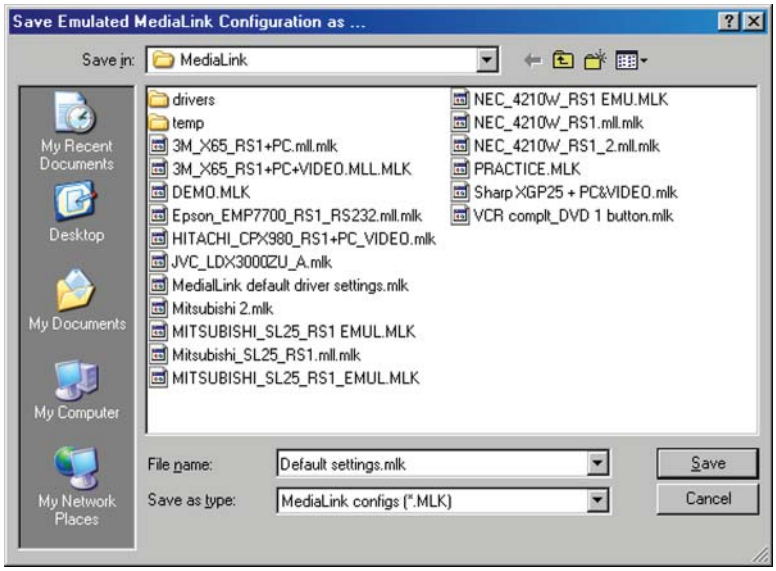
Initialize Emulated MediaLink settings from... window

3. You can create a new configuration starting from the default settings, or you can base the configuration on an existing setup.

   - **If you will be creating a brand new configuration**, click Cancel on the Initialize Emulated MediaLink Configuration from... window. The emulated system starts out with the DVCM 50 default settings.
   - If you want to create a configuration based on an existing configuration file, (one that was previously saved), select the desired configuration (___.MLK) file, and double-click on it to open it.

   The Save Emulated MediaLink Configuration as... dialog box opens.

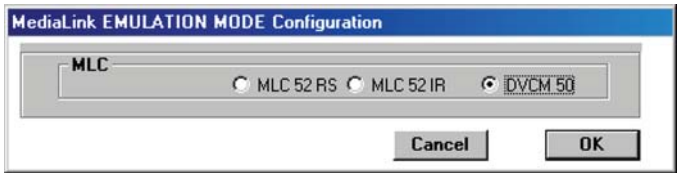
Software-based Configuration and Control, cont'd



Save Emulated MediaLink Configuration as... window

4. Enter a filename of your choice for storing the configuration settings (it must have a .mlk extension), then click Save.

   The MediaLink EMULATION MODE Configuration dialog box appears, as shown below.



5. Select DVCM 50, then click OK. The DVCM 50 main screen appears, with EMULATION MODE at the bottom.

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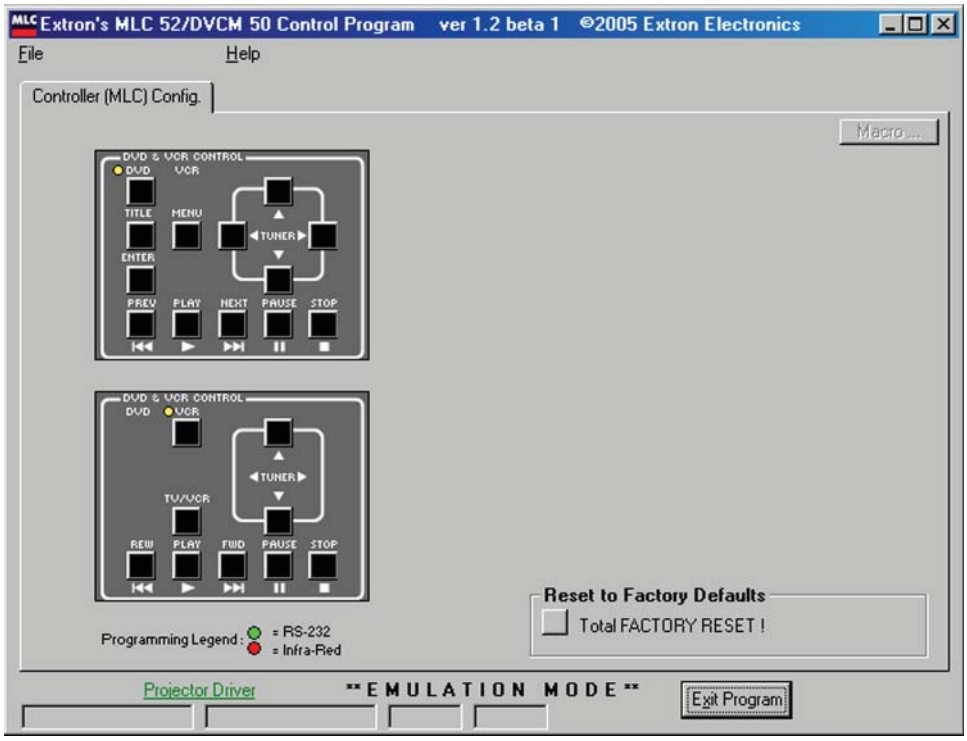

DVCM configuration program screen in emulation mode

6. Select the desired settings in each section of the program to configure the buttons, using the same processes described under *Assigning command functions to buttons*, earlier in this chapter.

   An exception is that in emulation mode you cannot perform IR Learning. You must have a DVCM connected to the host computer for IR Learning.

7. To save the configuration emulation for future use, follow steps **1** and **2** under *Saving and restoring configurations*, earlier in this chapter.

Uploading firmware

If the need arises, you can update the DVCM 50's firmware via RS-232. Visit the Extron Web site (www.extron.com), and check for firmware updates, which you can download. After you have downloaded the new firmware file to your PC, follow these steps to upload it to your DVCM.

1. Launch the MLC 52/DVCM 50 configuration software and save the current configuration. (See *Saving and restoring the configuration*, earlier in this chapter.)

2. From the File drop-down menu, select Update Firmware... .

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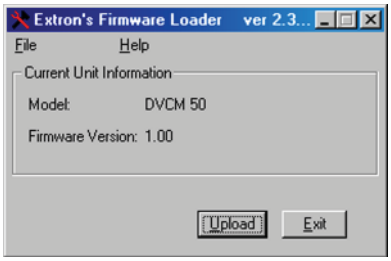
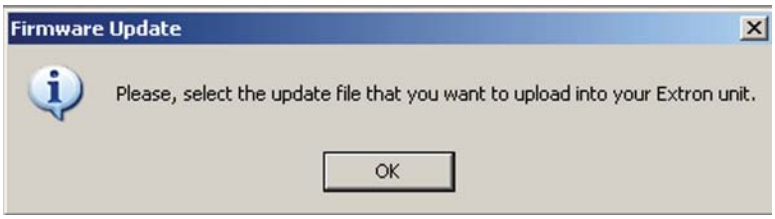
Software-based Configuration and Control, cont'd

The following window opens:



Extron's Firmware Loader window

3. Click Upload. The following prompt opens. Click OK.



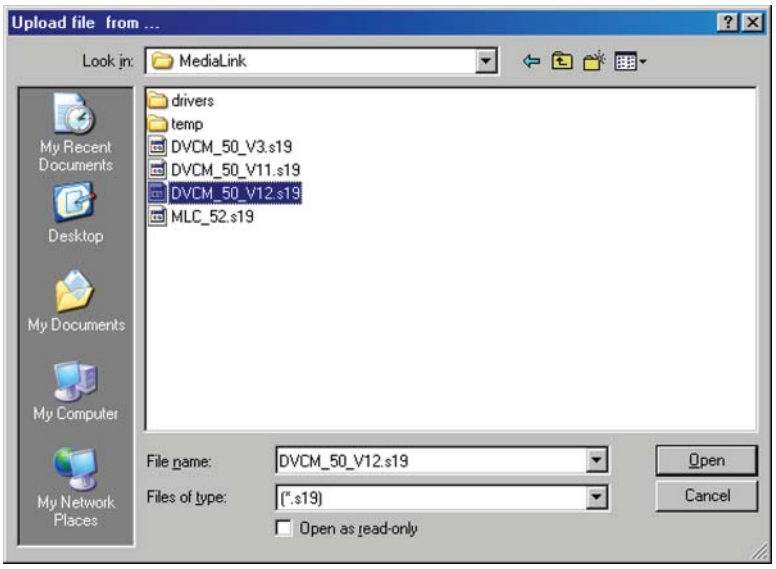
Firmware Update file selection prompt

4. On the Upload File from... window, locate and select the new firmware file. Firmware files are extracted to the following location:

   c:\Program Files\Extron\Firmware\DVCM 50\####vxxx.s19

   where **#** is an alphanumeric character and **vxxx** is the firmware version number.

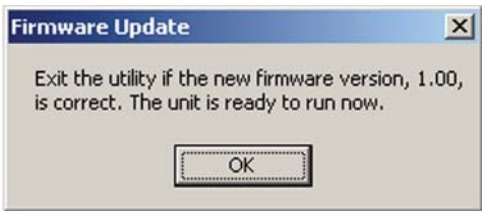
NOTE *Firmware update files have a .s19 extension; make sure that the "Files of type" field is set to *.s19.*



Upload file from... window

5. Click Open. The firmware update file is uploaded to your MLC. During the process, the Firmware Loader window indicates the progress of the upload.

6. When the upload is complete, the following prompt appears:



Click OK. The DVCM 50 configuration program window closes. When you reopen the configuration program, the new firmware version is in effect.

Using Simple Instruction Set (SIS™) Commands

Simple Instruction set (SIS) commands can be entered on your PC to find out more information about the DVCM 50.

Host-to-DVCM communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the DVCM determines that a command is valid, it executes the command and sends a response to the host device. All responses from the controller to the host end with a carriage return and a line feed (CR/LF =), which signals the end of the response character string. A string is one or more characters.

DVCM-initiated messages

When a local event such as a front panel (or Extron switcher front panel) selection or adjustment takes place, the DVCM responds by sending a message to the host. No response is required from the host. The DVCM-initiated messages are listed here (underlined).

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The DVCM sends the copyright message when it first powers on.

Error responses

When the DVCM receives a valid SIS command, it executes the command and sends a response to the host device. If the DVCM is unable to execute the command because the command is invalid or it contains invalid parameters, it returns an error response to the host.

The error response codes and their descriptions are as follows:

E10 – Invalid command

E13 – Invalid value (Number is out of range.)

E14 – Invalid for this configuration

Software-based Configuration and Control, cont'd

Using the command/response tables

The command/response tables on the following pages list valid command ASCII codes, the DVCM's responses to the host, and a description of the command's function or the results of executing the command. Upper- and lowercase characters may be used interchangeably in the command field.

The ASCII to HEX conversion table below is for use with the command/response tables.

ASCII to HEX Conversion Table										Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

ASCII to Hex conversion table

Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = CR (carriage return only) (hex 0D)

• = Space

Esc = Escape key

X1 = Firmware version number (X.XX format)

X3 = On/off status

0 = off/disabled
1 = on/enabled

?? = Memory block number in hexadecimal, where ?? can be 0 to 7F (hex) (0 to 127 decimal)

??d = Memory block number in ASCII numeric notation

NOTE *Commands are not case-sensitive unless otherwise indicated.*

Command/response table for SIS commands

Command	ASCII (Telnet) (host to DVCM)	URL Encoded (Web) (host to DVCM)	Response (DVCM to host)	Additional description
Firmware version, part number, and information requests				
Query firmware version number	Q	51	X1 ↵	Show the control module firmware version X1 (X.XX).
View IR/serial control board part number	N	4E	60-754-02, 60-754-03, or 60-754-05 ↵	Show the DVCM 50 part number: 60-754-02 = black 60-754-03 = white 60-754-05 = RAL9010 white
View model name	1I	31 49	DVCM • 50↵	
Reset				
Reset all switches to factory default and erase codes.	Esc zXXX←	1B 7A 58 58 58 0D	Zap • X ↵	Reset all switches and buttons to the factory default, and erase any codes programmed by the user.
Executive mode				
Disable executive mode	0X	30 58	Exe 0	Disable front panel lockout.
Enable executive mode	1X	31 58	Exe 1 ↵	Enable front panel lockout.
View executive mode	X	58	X3	Display status X3 of executive mode. 0 = off 1 = on
Upload firmware				
Upload firmware {number of data bytes}	Esc Upload ←		go... Upl↵	™

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Software-based Configuration and Control, cont'd

Command/response table for advanced instructions (for the MLC 52/ DVCM 50 Control Program

Data downloads and uploads are initiated by sending a series of hexadecimal commands to the configuration port of the DVCM 50. The Windows-based configuration software uses these commands mainly to load and save driver data and system configuration settings.

Command	Hexadecimal (host to DVCM)	Response (DVCM to host)	Additional description
Send / receive data to/from page 1 memory			
Send	1B 2B A2	Dnl 1 ↵	The host downloads 16 kB of binary data to page 1 of the DVCM 50's memory.
Receive	1B A3 0D		The DVCM 50 sends 16 kB of binary data to the host.
Send / receive a segment (256 bytes) of data (a segment relating to a single button)			
Send	1B 2B A6 [??]	Seg 0 ↵	The host sends 256 bytes of binary data to the DVCM.
Receive	1B A7 [??] 0D		The DVCM sends 256 bytes of binary data to the host.
Initiate or abort IR Learning			
Start IR learning	1B B0 [??] 0D	LrnRdy ↵ LrnTimOut ↵ LrnRetry ↵ LrnFail LrnOK ↵	Initiate IR Learning. Time out during IR Learning. Retry IR Learning. (Aim remote at DVCM and press button again.) IR Learning has failed. IR Learning was successful..
Abort IR Learning	1B D0 [??] 0D	Lrn Abort ↵	Abort IR Learning..
Activate a memory block (segment) / emulate a button press			
Activate a memory block	1B D0 [??] D	IRSnd* [??] ↵	Activate/trigger a memory block. (Send the command stored on that block.)

NOTE *[??] indicates the block number in hex notation, where [??] can be 0 to 7F (hex) (0 to 127 decimal). [??d] indicates the block number in ASCII numeric notation.*

NOTE *The responses shown are ASCII.*

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Appendix A

Specifications, Part Numbers, and Accessories

Specifications

Part Numbers and Accessories

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Specifications, Part Numbers, and Accessories

Specifications

Control/remote — controller host port

Serial control port	1 rear panel 2.5 mm mini stereo jack (tip-ring-sleeve)
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	Mini stereo jack: tip = TX, ring = RX, sleeve = GND
Program control	Extron's configuration program for Windows® Extron's Simple Instruction Set (SIS™)

Control — peripheral equipment

IR transport connector	(1) 3.5 mm captive screw connector, 5 pole for IR control (port is shared with power input)
IR control	TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz
IR learning frequencies	30 kHz to 62 kHz
IR learning distance	4" (10 cm) to 14" (36 cm) from the side panel

General

Power	12 VDC from an Extron MLC 104 or MLC 104 IP *or* from an optional external power supply
External power supply (optional)	100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.05 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount	Yes, with optional rack mounting kit, and also wall- and furniture-mountable with optional faceplates or AAP wall plates
Enclosure type	Metal
Enclosure dimensions	
Faceplate	2.8" H x 3.5" W x 0.1" D (7.1 cm H x 8.9 cm W x 0.3 cm D) (four space AAP plate)
Boards	2.7" H x 2.6" W x 0.9" D (6.9 cm H x 6.6 cm W x 2.3 cm D) (Depth excludes buttons. Allow at least 2.1" (5.3 cm) depth in the wall/furniture.)
Product weight	0.2 lbs (1 kg)
Shipping weight	1 lbs (1 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%.*

NOTE *Specifications are subject to change without notice.*

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Part Numbers and Accessories

Included parts

These items are included in each order for a DVCM 50:

Included parts	Replacement part number
DVCM 50 (black)	60-754-02
DVCM 50 (white)	60-754-03
DVCM 50 (RAL9010 white)	60-754-05
IR Emitter and Shield kit, Dual	70-283-02
Tweeker (small screwdriver)	
DVCM 50 Quick Start Guide	
Windows-based configuration software and *DVCM 50 User's Manual* on CD-ROM	
5-pole, 3.5 mm captive screw connector	10-319-10
3-pole, 3.5 mm captive screw connector	10-265-03

Accessories

These items can be ordered separately:

Adapters, power supplies, and faceplates	Part number
12 VDC, 1 amp external power supply	70-055-01
9 DB female 2.5 mm TRS configuration cable	70-335-01
AAP 102 mounting frame (black, white, or RAL9010 white)	60-300-02, -03, -05
MLM 104 LAAP (black, white, or RAL9010 white)	70-357-22, -23, -25

Control accessories	Part number
MLC 104 AAP (black, white, or RAL9010 white)	60-665-12, -13, -15
MLC 104 IP AAP (black, white, or RAL9010 white)	60-573-12, -13, -15
IR 452 Remote Control	70-543-01
IR Link IR Signal Repeater (black, white, RAL9010 white)	60-404-02, -03, -05
IRL 20 IR Signal Repeater	60-580-01

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Specifications, Part Numbers, and Accessories, cont'd

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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